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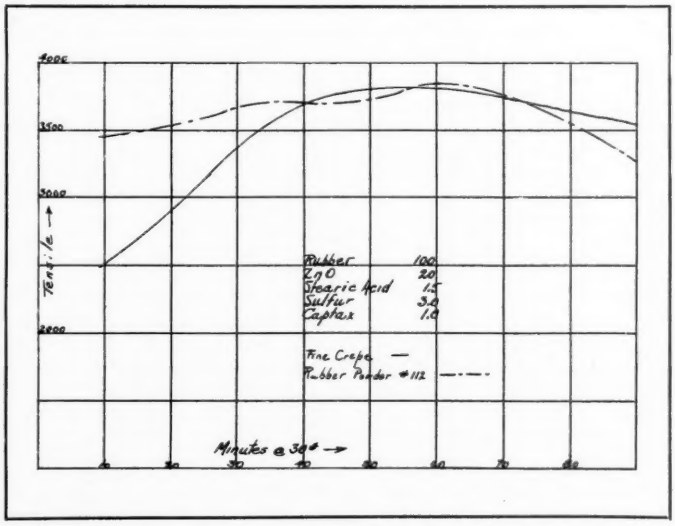
Rubber Powder

Royce J. Noble, Ph.D.[1]

THE concept of rubber in powdered form is by no means new, but its realization has been effected only within the last few years. That this form of rubber would possess very definite advantages over the usual forms of crude rubber, particularly as to power consumption in mastication and compounding, was pointed out by Pickles[2] in 1931, although much work on the general problem on the preparation of powdered rubber had been done several years earlier. St. Reiner[3] and Bridgwater[4] have indicated the desirability of rubber in powdered form, especially in compounding operations, because of the ease and thoroughness of the distribution of compounding materials and the saving in power. Other advantages of rubber in pulverent form, and applications peculiar to this material, will be indicated in the following text.



Comparative Cures of Crepes and a High-Modulus-Type Rubber Powder

In order that a rubber powder may be of the greatest general use it must possess certain definite qualities. Among the more important of these qualities are fine particle size and low non-rubber content (protective agent). As to particle size, it would be highly desirable, as Martin[5] has suggested, to produce particles 0.001-inch in diameter; at present this degree of sub-division has not been approximated, but it is easily possible by means of a suitable procedure to obtain a powder of 50 to 100 mesh. The amount of protective agent used to prevent cohesion of the particles should be reduced to the minimum, preferably not over 2% of the weight of the rubber.

The production of relatively coarse rubber crumb on the rubber mill, in the presence of caustic alkali or greasy materials, is familiar to all. Such particles are far too large, however, to be of any practical use. Modifications of this procedure have been devised in which a soft or spongy coagulum is sheared to produce a much finer crumb,[6] but which is nevertheless much too coarse to be of general application.

The earliest attempt to form a rubber powder was that of Wescott, in which latex containing hemoglobin was spray dried at a low temperature. This product was unsatisfactory because of the high amount of protective agent required and the difficulty of obtaining a thoroughly dry product. Other spray drying processes[7] have involved objectionable protective agents or have pro-

[1] Heveatex Corp., Melrose, Mass.
[2] Pickles, *India Rubber J.*, 1931, p. 611.
[3] St. Reiner, *Kautschuk*, 10, 36 (1934); *Rubber Age (N. Y.)*, 35, 4, 171 (1934).
[4] Bridgwater, *Rubber Age (N. Y.)*, 35, 4, 174 (1934).
[5] Martin, *Bull. Rubber Growers' Assoc.*, Nov., 1932.
[6] Twiss, McCowan, Lakeman, British Patent 391,309 (1933); Martin, British Patent 395,775; 396,880 (1933).
[7] Stam, British Patent 388,341 (1933); deSchepper, British Patent 392,592 (1933).

duced powders that easily cohere or that have large particle size.

Another type of process for the preparation of rubber powder has been developed by the Dunlop Rubber Co.[8] which involves the use of large amounts of compounding agents in order to form a pulverent composition. A process of this kind is, of course, of very limited interest to the rubber producer.

As has been stated, the amount of non-rubber material employed to maintain the rubber in a pulverent condition is of the greatest practical importance. It is necessary, on the one hand, that a small amount of such material be used both to assist in forming the individual particles and to prevent compacting and cohesion of the powder during shipment and storage; it is equally necessary, on the other hand, that the amount of such protective agent be at a minimum in order that the physical properties of the rubber may not be so adversely affected as to preclude its use in many instances. It is this matter of the proper selection of protective agent, and its use within commercially practicable limits, that has proved a barrier to the general use of rubber powder heretofore.

A rubber powder which is to a large degree free of the defects above noted, having only an extremely small amount of added protective, has been produced by a process recently developed by the author and now being operated by the Heveatex Corp. This process is a chemical one and results in the formation of a powder of fine particle size (up to approximately 100 mesh as desired), having a low content of a water-insoluble protective agent and possessing extreme stability to mechanical treatment. Either pure rubber powders or powders compounded to any desired degree may be prepared by this method. The powder may be made in a form redispersible in water to form a latex, having properties almost identical with the original latex—an entirely new step in the preparation of rubber powders on a commercial scale and of particular interest in its possibilities as affecting the costs of transporting latex. The flexibility of the process as it affects both the producer and the consumer is evident.

The property of the powder prepared by the above process having the greatest interest to the rubber manufacturer generally is the reduced time required for break-down on the mill, approximately ½ the time required for crepe, and the consequent reduction in power consumption. This characteristic, common to all powders prepared by the process, at present is the subject of exhaustive laboratory and plant tests. Should no other specific applications be found for this rubber powder, the saving in milling and manufacturing costs would justify its manufacture and its general use in the rubber industry.

Depending upon the source and treatment of the latex and details of forming the powder, a series of rubber powders may be made showing a wide range of physical properties, particularly as to plasticity, rate of cure, and tensile strength. The diagram shows the data for comparative cures of fine crepes and a rubber powder of the high modulus type.

Compounding of rubber powders may be accomplished at any one of 3 stages. Compounding ingredients may be introduced at the time the rubber powder is made; the ingredients thus are thoroughly mixed with and wetted by the individual rubber particles. For many purposes it is sufficient to compound the rubber powder with compounding ingredients by mixing in the dry condition. In such cases as the rubber powder is to be milled, the compounding can be conveniently done coincident with the milling. Colors, antioxidants, and accelerators may also be added at any convenient point.

The uses of rubber powders in various branches of the rubber industry have been only superficially explored. As already pointed out, it is felt that its greatest single use will be as a new form of rubber in direct competition with smoked sheets and crepe. While the cost per pound will be high as that of the usual forms of crude rubber, saving will be realized in reduced power consumption; for some purposes the use of heavy rubber machinery can be entirely eliminated. The economies due to rubber powder are evident, therefore, in the finished product rather than in the raw material.

There are certain immediate applications, however, to which rubber powder is particularly adapted because of its unique properties. For many molding purposes rubber powders suitably compounded to give hard rubber compositions may be conveniently employed. It is possible to prepare a powder of this type containing compounding and vulcanizing agents which may be introduced directly into a suitable mold and cured under proper conditions of temperature and pressure to produce hard rubber molded articles. Similarly, the compounded rubber powders may be mixed with other granular or fibrous material which is to be bonded together and then cured in a suitable mold.

Another use of rubber powders which promises to be of some importance is in those processes which use rubber as a raw material. For example, in the chlorination of rubber a very finely divided rubber powder offers a large surface for the reaction and appears to be well suited for such treatment. In such a process the use of the usual solvent is unnecessary.

The reversible form of rubber powder has many unusual properties, possessing in part the characteristics of both latex and rubber. It contains a certain amount of moisture, and when water is added to the powder under suitable conditions, it immediately disperses, forming a concentrated "latex" of very fine particle size. Although not necessary, slow dispersive agitation accelerates complete dispersion of the material. The resulting dispersion, depending upon the extent of dilution, is nearly identical in its physical and chemical properties with normal or concentrated latex.

It is evident that this form of rubber powder is particularly versatile as to application. Not only is it a convenient source of concentrated, aqueously dispersed rubber, but the powder may be used in the same manner as other rubber powders made by this process. In certain applications it is desirable to employ it as a powder, in the usual manner, and then reverse to an aqueous dispersion in *situ*, followed by coagulation, drying, etc. as desired.

Rubber in pulverent form is a product of interest to every one in the rubber industry. As a familiar material in a new aspect, it not only makes possible improvements in established processes, but suggests an entirely new technique in the manufacture of all types of rubber articles. To technicians in other industries it is virtually a new material.

[8] Murphy, Twiss, British Patent 327,451 (1930); Murphy, Niven, Twiss, British Patent 338,975 (1930); Patterson, British Patent 346,446 (1931); Murphy, Hatton, British Patent 405,956 (1932).

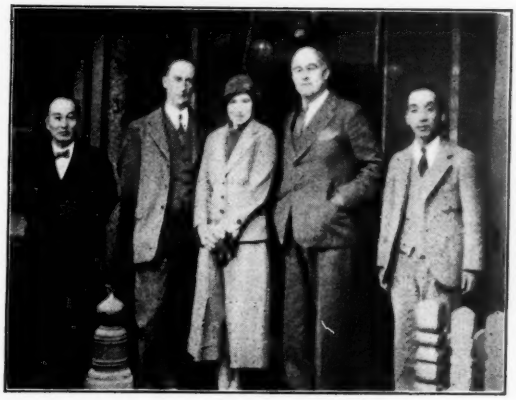
PROTECTING FRUIT. Growing fruit is protected by immersing it into liquid rubber latex or applying the latex in the form of a spray. The thin film, while being moisture-proof, is lightly permeable to air. In other words the article coated can "breathe" while being protected. If an accelerator is used to cause a positive vulcanization, then the resulting coating is permeable to all fluids.

The Awakening East

I—Japan

William B. Wiegand [1]

THESE lines are being written on the deck of the very English P & O liner, *Naldera,* as she slips through the island-studded entrance to Hong Kong harbor and then swings southward on her course for Singapore. And writing is not easy. The lazy swell of the South China Sea, the flash of the flying fishes, the occasional glimpse of a 3-masted Chinese junk pushing its grotesque but efficient hulk through these history-saturated waters, the humid languor of the tropics; these invite ease and contemplation—not action. But in the stateroom next but one, long after sundown, one hears the persistent rat-tat-tat of a typewriter as a famous newspaper correspondent records his impressions of the miracle that is quickly—albeit quietly—transforming this half of the world, and it seems unfair not to jot down a few of the impressions that have crowded every waking moment since the rocky profile of Nippon first broke the rim of the Pacific.



Mr. and Mrs. Wiegand and Japanese Friends

Power and Purpose

As one's liner sweeps by the bold headlands and enters the great Bay of Tokyo, the long, grey hulls of Japanese destroyers are seen everywhere. Suddenly one turns in our direction and, with twin crescents of spray curving from her bow, overtakes us and is seen to sweep our decks with binoculars in order to make sure that no cameras are in action; for these are fortified areas where photography is, shall one say, inadvisable. But we are forewarned and discreet so that after a minute or two our grey specter wheels sharply to port and soon makes off to merge with the grey haze of the mountains.

All at once we realize that in the shadow of this volcanic convulsion, this pile of barren mountain ranges, there dwell power and purpose. Here is no race of theorists and dreamers. This impression is confirmed by the deportment of customs officials who, although calm and courteous, leave no doubt as to who is master in their own house, and even by the hotel officials themselves, for in Japan there is no servility toward the visitor.

Here, then, is a race which, surrounded by a moat of ocean, and backed by impregnable mountain fortresses, has for over a dozen centuries been left inviolate to develop its genius and to forge its national character, the most securely placed nation of the modern world, an island empire like England, but without the propinquity —within 20 miles—of the world's greatest air force; self-contained and supporting as to food and many other essentials; its army trained and modeled on German, its navy on British lines.

Hospitality and Charm

But when you have settled down and begun to meet, and to make, Japanese friends; when you have motored through the country-side and seen the smiling and happy faces of chubby children; when you have wandered, apart, through the historic parks of Nara—the restful, or over the mountain trails of Myanoshita —the magnificent, within the shadow of Fuji; when you have broken bread with your hosts and sensed the subtle nuances of their minds and manners; when you have become the embarrassed recipient of their limitless generosity, then you begin to see another side of the Japanese character, one which deserves more emphasis, especially in these days.

The Cult of Westernism

Let no one think that the almost overnight metamorphosis of Japan signifies an abandonment of the age-old indigenous culture. The Japanese are much too wise to imitate our fratricidal philosophy. They are taking from us the one and only feature in which we have been superior: our experimental and applied science. It is also a common error to dub them a nation of imitators. They are, it is true, seeking to begin where we leave off, but they are not stopping there. Ask your professor of mathematics about the modern school of "math" in the Imperial Universities. Ask the foreign industrialist in Japan about the creative features of present-day Japanese engineering, and you will be quickly disabused of any such conception.

Japan today is mechanized, is master of the engineering arts and sciences, and by the same token, of the western art of warfare, so that now one finds in her the most astonishing paradox of history—a nation of 70,000,000 Orientals "shuffling along in tabi and geta," but interlaced with hydro-power lines, automatic traffic signals, and loud-speaker train announcers! The falsetto squeak of the ancient Japanese drama narrator combined with modernistic stage lighting effects.

Gummi Elastica

Now a word about our confreres in the resilient art, the industry of feast or famine, in which we are individually successes, but collectively an egregious failure!

The motorization of Japan has only begun. Present registration of motor vehicles is 110,000, and annual out-

[1] Director of research, Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

put 18,000 to 20,000. In a nation of 70,000,000 now bent on mechanization it is easy to understand why the 3 existing tire plants are kept busy. The saturation point is indeed far distant. These plants are all modern and efficient. Dunlops (Far East), the Yokohama Rubber Co. (Goodrich affiliate), and the Bridgestone Rubber Co., a Japanese concern which, in addition to tires, has a capacity of 50,000 pairs of rubber footwear daily.

If you drop in on Mr. Morton, the young Englishman at Dunlops, who has had an unique career in the erection and management of rubber factories in the Far East, he will tell you that his machinery can now be designed fully as well, and of course much more cheaply, in Japan as in England or America. Incidentally, he can (if he will) show you some ingenious wrinkles of his own which may even have escaped the alert intellects of Akron's engineering experts! Before you leave Dunlops send in your card to Mr. Wilson, the polished managing director who guides the destinies of this far-distant member of the great Dunlop family in the best English tradition, with a minimum of fuss and a maximum of results! The Dunlops works are near Kobe, the busy seaport almost contiguous with Osaka, the great industrial city. These 2 points constitute the entrepôt for the south and west parts of Japan.

An overnight journey in a de luxe sleeper takes you to the Tokyo-Yokohama district. These 2 cities constitute the other major industrial center and are only a half hour's journey apart. Midway between them you will find the Goodrich affiliate, the Yokohama Rubber Co., all spick and span and streamlined in the most modern style. Fortified with letters from Mr. Graham and Mr. Moss, at Akron headquarters, you are cordially received by Mr. Merritt and his colleagues, and it will not take you long to realize that Goodrich sends only hand-picked ambassadors as its overseas representatives.

The Bridgestone Rubber Co. is located in Kurume on the island of Kyushu and, being somewhat off the beaten track, could not be included in our hurried itinerary. However (cf. Mohammed and the Mountain) we were fortunate in having the opportunity to meet, at our lecture, Mr. Matsudaira, the keen young chief chemist of the company who speaks excellent English, and to exchange gossip and ideas with him. You soon become aware that although without foreign affiliations this concern is in the front rank of technical development.

Meeting Japanese Chemists

To those with a message for the rubber chemists of Japan there could be no more painstaking host than the Japan Rubber Manufacturers' Association. A meeting is most conveniently arranged in Kobe, a great rubber center. The attendance is likely to prove a pleasant surprise. In our case, where at most 50 were expected, well over 200 came, from various points in the Island.

They prove a most attentive and appreciative audience. Interpretation is advisable since, although a great many of the rubber fraternity read English, they get very little practice with the spoken language and find the pace a bit too rapid. In this connection the English speaking lecturer will notice a curious and characteristic circumstance, viz., that what can be expressed in our language in one sentence consuming only a few seconds of time requires, when translated into Japanese, a much longer time and seemingly a great many more words. This derives, of course, from the totally different character of the Japanese, and for that matter the Chinese, language. The Oriental mode of expression is not direct and to the point, but instead elaborate, flowery, and always replete with courteous and flattering references. It is well, therefore, to compress one's ideas within a minimum of language, which is "good medicine" in any event.

The dignity of a Japanese audience or gathering of any kind is outstanding. They are a serious people not given to the exuberance, chaffing, and banter which enliven our Rubber Division meetings.

As to the response or "reaction" of a Japanese audience, this is likely to prove, in the first instance, somewhat of a disappointment and is probably due in part to language difficulties, in part to the restraint and taciturnity of their temperament (the Japanese do not cheer their public personages or even their emperor; they maintain a complete silence which is indeed most impressive), and in part to a shyness in asking questions in the presence of their colleagues.

There is, interestingly enough, a difference in this respect as between the Japanese of the Kobe-Osaka district and those of Tokyo. The former are said to be more conservative and old-fashioned, the latter more westernized and expressive, and the writer was impressed with this difference when repeating his talk to the rubber chemists of Tokyo and Yokohama.

In all cases when opportunity is offered for individual conversation, after the group meeting is over, one is impressed by the lively interest in every topic discussed. At this point it seems worth while to correct a misconception which seems prevalent: namely, that the Japanese are always asking questions, but never willing to give in return. The writer found the reverse to be the case and never once met with this "sponge-like" attitude.

It goes without saying that research is being actively prosecuted in this island empire, and it is a matter for regret that the *Journal* in which the work is published is not regularly available in English translation. The present writer will not soon forget the kindness of Tokyo colleagues in presenting him with a complete volume of the Japanese Journal of Rubber Research from the beginning. May the day be not distant when an international meeting of rubber chemists takes place, let us say in Montreal, at which the American, Canadian, and European workers will meet with their Japanese colleagues and give a convincing demonstration that no matter what politicians may foment in the way of international rivalries, at least there is sympathy and understanding among the scientific fraternity, however far separated by distance and language.

But time presses. Having met with our groups of fellow-workers in rubber, in ink, in paint and lacquer, and having eaten our fill of beef and chicken sukiaki, of Gura-Nabi, and all the seafood delicacies which to the gourmet are alone worth crossing the Pacific to ingest, we suddenly realize that our steamer sails next day from Kobe. The room-boy at the Imperial Hotel packs us up, and soon we are in the observation car of the Imperial Government Railways night express. Through the open window we wave a final *au revoir* to our Japanese friends, new and old, and soon the snowy helmet of mighty Fugi passes for the last time into view and then is gone, save in memory.

As our giant vessel picks its way through the jostling swarms of tugs, sampans, and launches in Kobe harbor, passes the breakwater and stands out to sea, we linger at the rail, our minds crowded with memories of this strange and fascinating empire, so ancient and yet now so modern, so kind and yet so cryptic. Once more the skyline of mountains looms darkly to remind us that we are leaving a land and a people who have wrested a livelihood from a tumbled mass of volcanic upheavals. We turn and on the horizon see, once again, the cold gray shapes of destroyers patrolling these waters in unceasing vigil.

Rubber and the Machine Age

David Phillips

Fig. 1. Knock Press

RUBBER or caoutchouc became known to civilization about 1500 A.D. During the brief period of absorption into our domestic and industrial life since the discovery of vulcanization 95 years ago, tremendous strides have been made in expanding its usefulness and in developing better methods for its manufacture.

In its early history one reads about bouncing balls, crude water jugs, rubber shoes, clothing, uncured rain mantles, and other articles which now seem inadequate when compared to the extensive list of rubber goods now available. Not until 1770 did medicine and art begin to find a practical use for caoutchouc. Priestly at that date named caoutchouc rubber because the gum served satisfactorily to remove lead pencil marks from paper.

Progress Dates from Vulcanization Discovery

Charles Goodyear's discovery in 1839 that sulphur, when mixed with rubber and subjected to heat, would transform the sticky mass to a consistently elastic substance opened the way to the important part rubber was to play in the machine age.

After Goodyear had demonstrated to the world that he could make dependable rubber goods by his vulcanization process, the field was immediately opened for commercial expansion of rubber footwear, clothing, and other useful products. As demand increased, crude hand methods of manufacturing were replaced with mechanical aids for handling this raw material. In fact the need of rubber goods has so increased in volume that a long train of interlocking machines for handling rubber was invented to manufacture waterproof rubber goods at a price within the reach of the average buyer.

Mill Room Machine Advancement

Edwin M. Chaffee, an American colleague of Charles Goodyear, invented the first iron roll, steam heated, rubber mixing mill. This machine filled the need at that time of production equipment and created the market for the present chilled and hardened mill rolls so necessary to withstand the rough usage in modern mill room practice. Heat indicators and means for controlling speed and many other features have been added from time to time to control more accurately the quality of the mixed batch.

Among the various mill room machines of the heavy-duty type developed might be listed rubber washers, driers, shredders, slicers, open and enclosed mixing mills, warmers, and many others. Back of the development history of each machine years of patient toil were required before its operation and economy were satisfactory. The list includes heated and cooled rolls for long wear, safety clutches, magnetic brakes, individually powered units, conveyer service, and simple roll-bite adjustments. A great variety of accessory improvements such as automatic lubrication and frictionless bearings have been added as the particular needs of the rubber industry became apparent.

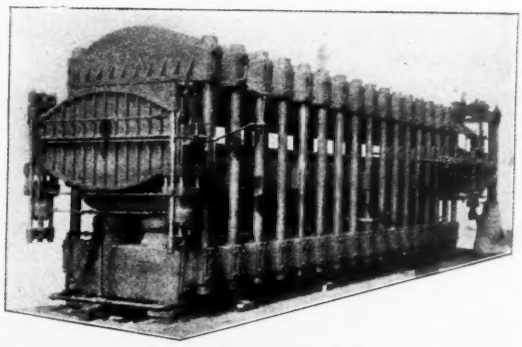


Fig. 2. Farrel Belt Press

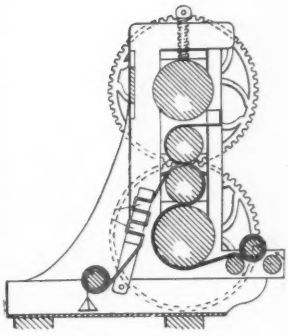


Fig. 3. Chaffee Calender

Fabric Machinery and Calenders

The development of machinery for handling rubber fabrics would make a long story. In brief, both rotary and flat types of steam driers have been designed to remove dampness from fabrics. Without fabric driers blistered and poorly adhered rubber coating would result if steam formed in curing were to escape through the rubber surface. Singeing machines, stretchers, tentering devices, brushers, calenders for frictioning and coating, plying up drums, and coolers are some of the many devices required by the rubber industry in handling fabrics by machine age methods.

The development of calenders is an interesting story. Briefly a calender is a sheeting machine for forming relatively thin sheets of rubber stock. It is also used for coating fabrics with gum compounds either by rolling or frictional contact. It was Chaffee, designer of the first practical mixing mills, who also invented the first calender. He mounted 4 steam-heated rolls, one above the other, in a frame for rubber coating fabrics, thus contributing another basic machine to the art of rubber and fabric processing.

The practice of calendering has been greatly facilitated by better machines, and more efficient accessory equipment has been adequately supplied by the machine building industry. In the early calenders one had a choice of 2 speeds only. Today an infinite variety is possible from barely perceptible motion to some 30 yards a minute, owing to the adaptation of variable speed controls to the driving mechanism. This variable speed feature of the mod-

ern calender is very important when starting a new run or testing stock for thickness, adjusting cutting devices, inspecting for blistered stock, tackiness, etc. Much of the former waste stock resulting from the lack of speed control can thus be eliminated.

Many ingenious wind-ups incorporate varying speed features to compensate for the changing driving diameters of the fabric rolls and coated materials as they are wound for storage on calender shells.

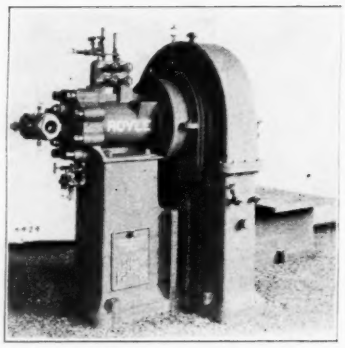


Fig. 4. Royle Tuber

Rubber's Mechanical Art—Engraving

Engraving calender rolls and press plates to impart a design finish on sheeted gum materials is a very necessary link in the chain of mechanical aids to production which were unknown at the time of the early calender developments. As time has passed and a demand has been created for fancier surface finishes, rubber manufacturers have been obliged to call on the engraving industry to furnish them with means for producing desired style and ornamental effects. The process of engraving on calender rolls, press plates, and tire molds requires the utmost in patience and skill to impress correctly ornamentation on sheeted and molded rubber materials. The need, moreover, of such engraving has given us automatic machine tools which ingeniously utilize the pantograph and other transfer schemes for accurately cutting designs to the desired master pattern. Hours of tedious hand work can now be performed quickly on metal and very accurately.

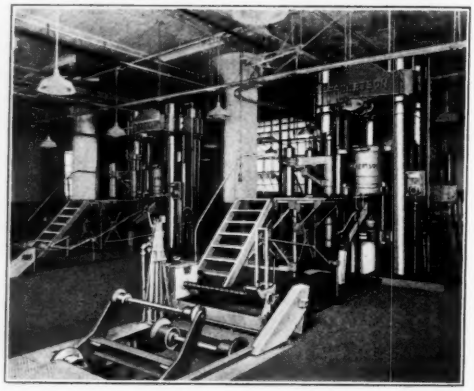


Fig. 5. Robertson Lead Press

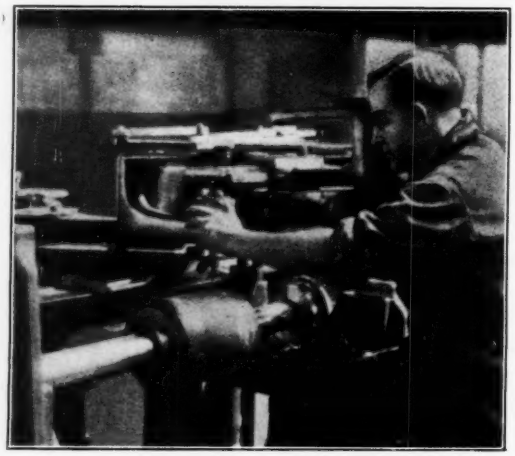


Fig. 6. Gorton Engraving Machine

The demand for special designs on such materials as artificial leather, auto topping, druggists' sundries, shoes, and sportswear has become more and more exacting as competition has increased. Without the machine tools that the machine age has given the world the cost of producing the artistic and eye-pleasing rubber articles on the market today would be absolutely prohibitive.

Early Molding Presses

One of the principal operations in rubber production is forming and curing gum stocks in metal molds held between steam-heated platens under heavy pressure. One of the early forms for small work was similar to a book press and operated by a hand-wheel and vertical screw to which a horizontal platen was attached. A clutch arrangement within the hub of the hand-wheel enabled the operator to back off the platen after almost closing the mold, and by forcing it forward again and "bumping" the top press plate complete closing and mating of the design were insured. Such presses were called "knock" presses because of this impact feature.

The history of press development includes various schemes for operation, including double-threaded screw feeds, toggle-joint mechanisms, and other comparatively crude devices when one considers our modern multiple platen, hydraulic operated press vulcanizers capable of exerting enormous pressures and controlled by practically finger-tip operation. The use of hydraulic press vulcanizers today covers almost every branch of rubber manufacture. These presses are built with single rams for light work such as crutch tips, small syringe bulbs, and other innumerable small objects. There are also long platen presses operated by 20 or more coacting rams for molding and curing flat work such as mine belt conveyers, power transmission belts, and sheet flooring.

Some of the modern improvements in presses embody automatic temperature controlling devices, automatic release at the end of the curing cycle, and self-opening molds.

Progress in Tubing Manufacture

Tubing manufacturers in early days used hand labor entirely for making tubes. Rubber tubing stock was calendered to the required thickness and run on to sheeting; then it was wound on a drum or shell. After the roll of stock was placed in a storage frame, it was drawn off as needed on to a long table where 4 or 5 men rolled it simultaneously around a long metal pole of the required diameter for the inside dimension of the finished tube.

When the necessary number of plies had been rolled, the tube and the metal pole were cut from the rest of the sheet along its entire length by a hand knife. It was next tightly wrapped in wet fabric and laid into a long pan, there to await the process of vulcanization.

Such crude methods produced extremely short lengths of tubes and could not long remain in general practice when demand for increased lengths and thinner, seamless walled, and ribbed tubing became urgent. The development of the tubing or extruding machine was a logical solution to the problem. The modern tuber is extremely flexible and can be made to produce tubing of many varieties. It turns out tubes of all gages with plain or rubber exteriors and soapstoned inner walls to prevent sticking and collapsing before vulcanization. Even flat sheets of relatively narrow widths can be formed by slitting the tube with a knife as it emerges from the heated

(*Continued on page* 38)

Elemental Time Analysis

For Standardization of Methods and Rate Setting

J. D. Towne [1]

THE setting of rates or production standards in the rubber industry, as well as practically all other industries, has passed through several successive stages of development until today our national economic condition demands further improved means of rate setting unquestionably fair to labor and industry alike.

Originally labor was paid a straight day wage varying perhaps according to length of service but based primarily upon the premise that certain work was, by its very nature, worth a certain day or hourly rate regardless of the amount or quantity the worker produced. Early in the 19th century the idea of paying the worker a definite price for each piece or unit produced was developed and as production through the use of machinery grew in volume, "piece work" became a well established plan of wage payment.

The only method of setting piece-work prices at that time and for many years after was the more or less inaccurate guess of the department foreman, influenced somewhat by past experience as well as by the attitude and arguments of the man on the job being priced. This method led to rates both too high and too low with consequent rate cutting and much dissatisfaction on the part of every one concerned. Frederic W. Taylor, about 50 years ago, conceived the idea of making a time study, a systematic study of the time consumed in performing certain work in order to learn as much as possible regarding the details of each job as well as the time it actually should take, as a basis for setting these piece-work prices.

Time study's first object in Mr. Taylor's mind was to obtain a square deal for the workman, and while it did much to improve the condition existing at the time in this regard it also formed the first step in our present-day plan of industrial management. From it have sprung the many forms of wage payments and incentives in effect today as well as production planning, scheduling, routing, and shop control. In fact practically every phase of management has been very definitely affected and improved either directly or indirectly through this revolutionary idea of time study.

During the 50 years since time study became first recognized as an improved method of rate setting, etc. many changes have taken place in industry; and while Taylor's basic idea is still sound in every sense, it has become increasingly desirable to develop a more accurate and precise method of analyzing any given job through its various elements rather than by taking the job as a whole, in order that similar jobs may carry similar rates, and that even complicated operations through elemental analysis may be understood and rated in accord with their proper value. In addition, present industrial conditions require a method of scientific analysis of every operation that will disclose any weaknesses in manufacturing procedure and afford an opportunity of improving such methods with consequent lowering of manufacturing costs.

[1] Consulting engineer, Dayton, O.

In handling any such problem in industry, great care must be taken in order to keep scientific analysis and practical methods in complete balance. The engineer without sufficient experience or with too great a leaning toward unproven theory is apt to go to extremes in his attempts to develop some method that will afford exactitude in a degree that is entirely impractical in the vast majority of manufacturing problems. The problem in industry today is not the exact time required to 0.001-minute for an operator "to flex the right elbow," "to bend 45° from the waist line," or "to grasp with left hand," determined from supposedly studying thousands of "right elbows," "waist lines," and "left hands" throughout the country.

Actually, certain time allowances under the heading Characteristics of Motion were in rather wide use throughout industry and in one or more rubber plants that claimed precision down to 0.0001-minute. These characteristics included: starting finger movement, 0.00075-minute; wrist movement travel, 0.00025-minute; stopping shoulder movement, 0.00090-minute; and many others covering the ankles, hips, back, etc. and practically every other joint and muscle in the human anatomy.

It is not at this time the contention that the standards used are not accurate but rather that such attempts at extreme accuracy defeat their own purpose, and either can only be applied successfully in a small percentage of cases or else the application will take so long that the time and expense would be prohibitive. Coal, iron, silver, and gold are present to some degree in many parts of this country; however their presence is so limited in most places that the expense of mining would more than use up the value of the ore obtained.

But, between the insufficient results of average time studies and the theoretical extremes of such ultra methods as have just been mentioned, there is a middle ground, a method that in a thoroughly practical way analyzes each operation into its component parts, determines the proper time and method for every element according to conditions peculiar to each individual plant and so standardizes the time allowed and the methods used that similar jobs are sure to carry equally similar time allowances and to be performed in a very similar manner. Elemental time analysis is the combination of fundamentally sound study and analysis, together with practical common sense applied to the manufacturing problems peculiar to each individual plant.

In starting elemental time analyses in a tire plant, one department should be chosen and a complete analysis made of the operations involved. For example, in the tire building department one section may be given over to building truck tires on Goodrich machines. This section should be considered as a unit and each builder analyzed thoroughly in regard to elemental operations involved, as detailed in the study shown below, in order to determine that every man is actually following the same procedure in building his product; likewise through

study and comparison to determine and eliminate false motions and build up a uniform sequence of operation that can be standardized throughout the department.

After the proper procedure and method have been determined this same list of elemental operations is timed with a stop watch over as many complete cycles of tire building as are necessary to determine the correct time for each element or sub operation. Usually, and especially in the beginning of the work in each department, at least 6 complete tires should be timed with individual watch readings noted for each element. These studies are made upon regular forms similar to those used in many plants for ordinary time studies. It is most desirable in making these analyses to permit the watch to run continuously through the entire operation, and to note the separate cumulative readings at the completion of each element. A competent observer can make immediate subtractions between readings in most cases and write down in a space provided the elapsed time for each element as the study is being made. This enables comparisons to be made at once and shows up elements as questionable and requiring further study when the fluctuations are too great. Incidentally, the more uniform the watch readings on the comparable elements of each successive tire built the fewer tires are required to be studied.

After the time analysis has been completed on the tire being studied each element is considered separately by the observer in order to determine the proper allowance or standard time. This standard time for each element, which should represent the best time in which it can consistently be done, is not merely an average of all the readings obtained but rather depends much upon the judgment and experience of the observer and how sincerely and consistently the operator worked when the times were being taken. If the fluctuations between readings are quite great, it is usually safe to believe that the operator has not put forth his best efforts but has rather stalled in an endeavor to take advantage of the observer. On the other hand readings that do not vary more than 5 or 10% between tires signify honest endeavor by the builder in accordance with his own individual skill. This ability to check the effort put forth and the consistency with which the work is being performed even as the study is being made is a very valuable phase of elemental time analysis.

After the allowable standards for each element have been determined and noted, the total of these standards represents the "net" time for the entire operation. In addition to this certain allowances must be made to cover personal exigencies and fatigue throughout the working day. At times other allowances are necessary in order to cover time consumed in such operations as sharpening tools, etc. These operations are studied separately from the main operation. Fatigue allowances will vary with each shop and, at times, with each department or operation. Under the present curtailed working day 12.5% added to the "net" time will be about the average fatigue allowance necessary. The result of this addition to the "net" time gives the standard time per tire; that is, the total time in which each tire of the kind and size under consideration can be built steadily throughout the working day by a good workman.

By setting up the standard arrived at in this manner as 100%, the actual performance of the builder each day can be checked against it and his individual efficiency easily determined. This also enables an equitable comparison of productive efficiency between workers employed on similar or even different operations. Such comparison has been accepted by both labor unions and employers as a proper means of determining what men should be dropped from the payroll when layoffs are necessary.

Below is shown an actual example of an elemental time analysis made on a 9.75 by 20, 12-ply truck tire built on a Goodrich machine, 6 section core. The elemental operations are just as standardized in this shop; the times, while approximately correct, are not exactly as used in practice. However the example demonstrates the method followed in determining the proper times. The procedure used in standardizing the elements cannot be gone into at this time.

ELEMENTAL TIME ANALYSIS

Operation: Build 9.75 x 20—12-Ply Truck Tire
Equipment: Goodrich Machine (6 Section Core, 4 Removed)

Operator: #1611 Date: Apr. 30, 1934
Time started: 7:00 A.M.

	Actual Times						Standard Set
1. Place 2 beads over core	.52	.54	.49	.55	.50	.54	.50
2. Assemble core; clean and cement	1.75	1.88	1.62	1.92	1.55	1.60	1.60
3. Assemble 1st band; line up	2.80	3.33	3.02	2.78	2.92	3.28	2.84
4. 1st band over groove with paddle, stitch, and trim	6.02	5.52	5.38	6.10	5.43	5.45	5.43
5. Gum strip under wide flip	1.00	.92	.88	.90	1.05	.90	.90
6. Assemble wide flip	3.50	3.76	3.98	3.62	4.01	3.91	3.62
7. Assemble dodums	1.38	1.42	1.28	1.44	1.30	1.39	1.30
8. Assemble 2nd band; line up	3.20	3.22	3.10	3.38	3.18	3.10	3.10
9. 2nd band to heel, paddle and thumb down; no trim	6.06	5.50	5.66	5.98	6.01	5.58	5.60
10. Assemble 1st bead; turn back; trim	11.26	8.60	8.72	9.10	8.75	9.05	8.70
11. Assemble gum strip over bead	.98	1.11	1.01	1.24	1.18	1.02	1.00
12. Assemble 3rd band; line up	3.38	3.02	2.75	2.65	2.72	3.10	2.70
13. 3rd band over bead and trim at toe	5.94	6.02	6.54	6.79	6.34	6.04	6.00
14. Assemble narrow flip	1.68	1.55	1.72	1.55	1.64	1.58	1.55
15. Assemble 4th band; line up	2.92	2.85	2.82	2.71	2.75	2.99	2.75
16. 4th band to heel; no trim	5.72	5.32	5.52	5.34	5.92	5.48	5.35
17. Assemble 2nd bead; turn back; trim	12.61	9.52	9.32	9.40	9.78	9.38	9.38
18. Assemble gum strip over bead	1.03	1.08	1.22	1.01	.98	1.18	1.00
19. Assemble 5th band; line up	3.52	3.10	3.15	3.48	3.29	3.31	3.15
20. 5th band over bead, and trim at center line	7.22	6.66	6.38	7.61	7.49	6.40	6.40
21. Finish assemble wide flip	1.92	1.98	1.96	1.96	2.08	2.04	1.96
22. Assemble gum strip over wide flip	1.19	1.00	1.00	.90	.92	.92	.92
23. Assemble 6th band; line up	2.98	2.95	2.70	2.70	3.18	2.81	2.70
24. 6th band over bead and trim at toe	10.64	9.21	9.22	8.75	8.86	8.80	8.80
25. Assemble 1st breaker	1.98	1.82	1.82	1.96	2.22	1.90	1.84
26. Assemble 2nd breaker.	1.38	1.52	1.40	1.61	1.40	1.81	1.40
27. Assemble filler extension	2.18	2.29	2.12	2.39	2.10	2.51	2.10
28. Assemble cushion; roll.	2.22	1.95	1.98	2.10	2.01	2.05	1.95
29. Assemble tread; trim, benzol, splice, and roll	2.95	3.10	3.02	3.38	3.46	3.04	3.00
30. Stitch sides of tread and assemble	2.30	2.52	2.30	2.89	2.64	2.32	2.30
31. Trim sides of tread, and scrap	.98	1.20	1.18	1.34	1.10	1.16	1.16
32. Break tire loose from core	1.01	1.23	1.26	.98	.96	1.05	1.00
33. Strip tire (4 loose sections)	2.98	2.43	2.88	2.23	2.31	2.25	2.25
34. Roll tire to finisher and return	.62	.49	.58	.52	.46	.54	.50
Net time							104.75
12.5% Fatigue allowance							13.25
Total standard time (100%)							118.00

All the above times are expressed in minutes—or hundreths thereof. In the above example it will be noticed that elements quite similar in description do not necessarily carry the same standard time allowances. This may be due to actual differences in the work performed that are not apparent in the abbreviated description of the element.

From this point the standardization of elements between various similar operations is developed. For example if .50-minute is the correct allowance for the first element in building the tire described above, i.e., "1. Place 2 beads over core," the same allowance should likewise

(*Continued on page* 36)

Rubber Thread in Narrow Fabrics[1]

Edwin J. Gibbons [2]

THE following concludes the interesting and informative article on rubber thread in narrow fabrics begun in our July 1, 1934, issue.

Round Rubber Thread

Round rubber thread is comparatively new on the market. It is formed by extrusion under pressure through a given size of orifice in much the same manner rayon is produced. Immediately upon extrusion it is immersed in a coagulating solution. It is marketed under various trade names, such as spun latex, Lastex, Latrone, etc.

In size round rubber thread ranges as high as No. 80 and No. 100, and though it may be used bare, it is generally covered. It may be single, double, or triple covered with any of the various covering materials. The size of a given round rubber thread is based volume for volume on the equivalent square-cut rubber. In other words, the diameter of a given round rubber thread would bear the same relation to its equivalent in a square-cut rubber as the diameter of a given circle would bear to one side of a square of equal area. The figure used to convert a given round rubber to its equivalent in square-cut rubber, or vice versa, is the same figure as is used in mathematics to find the side of a square of equal area to a given circle, viz., 0.8862. Therefore to find the round rubber equivalent of a given square-cut rubber, multiply the cut rubber size by 0.8862.

Example: What is the round rubber equivalent of a No. 32 square-cut rubber?

Solution: 32 x 0.8862 = 28.3584, or a 28.4 Lastex

To find the square-cut rubber equivalent of a given round rubber, divide the round rubber number by 0.8862.

Example: What is the cut rubber equivalent of a No. 32 round rubber?

Solution: 32 ÷ 0.8862 = 36.1, or a 36 cut rubber

Covered Rubber Thread

A great proportion of the rubber thread used in narrow woven fabrics is covered, as has been stated. Cotton, mercerized cotton, rayon, silk, etc. are commonly used as coverings, and each may be used alone or in combination with any of the others.

The operation of covering is effected on a machine especially designed for the purpose, and consists of winding the covering material spirally around the rubber thread while the latter is held under tension.

Figure 3[3] represents a standard-type rubber covering machine with a capacity of 60 ends when applying a double cover or 120 ends when applying a single cover.

Single or double covering may be accomplished in one operation, and the outer or second covering is usually applied in the opposite direction to the first or inner covering. The inside covering generally has a great many more spirals per inch than the outer covering. One, two, or more rubber ends may be enclosed within the cover, though commonly but one end is enclosed.

The rubber supply, that is, the bare rubber thread, is placed on a beam at a distance of 10 to 12 feet from one end of the machine, and the ends are separated by a comb or open-top reed set close to the machine. Each rubber thread is then passed around a small wheel about one inch in diameter, located directly below each spindle, and then immediately up through the hollow and fast revolving spindle upon which is the spool carrying the covering thread. If the rubber is to be double covered, it passes up through yet another hollow revolving spindle upon which is the spool carrying the outer covering.

As the rubber threads are covered, they are drawn around a series of rods by the take-up mechanism, and so to the beam upon which they are wound. The take-up is effected by the draft of a split star wheel on the take-up shaft. The whole 60 ends, or 120 ends if single covered, may be wound on a single loom beam or any number of beams within reason.

The cover yarn is drawn from the side of the spool, passes through the eye of a flyer that rests on the head of the spool, and thence to the rubber thread around which it spirals. The number of turns twist per inch in the cover yarns has a great effect on the resulting rubber thread, as has also the number of ends per spool. The best results are obtained with soft twist covering yarns.

The speed at which the rubber is drawn from the rubber beam, in relation to the speed (that is, revolutions) of the covering spool, will determine the amount of covering yarn applied to the rubber thread, and this, in turn, will govern the stretch of the resulting material. The size or count of the different covering yarns is also a factor. The greater the number of spirals per inch applied to the rubber the less will be the stretch of the resulting product. Similarly the smaller the number of spirals per inch the longer will be the stretch of the final thread. Covered rubber threads seldom have a stretch of less than 100% and very rarely exceed 250% stretch. In double covered rubber all the factors must be very nearly correct or the resulting product will often exhibit a decided tendency to kink. Some common covering combinations follow.

Single Covered	Double Covered	
	Inside	Outside
3 ends 10/1	3 ends 10/1	1 end 26/2
3 ends 12/1	3 ends 16/1	1 end 40/2
3 ends 16/1	3 ends 16/1	1 end 20/2
4 ends 16/1	4 ends 20/1	1 end 40/2
3 ends 20/1	3 ends 20/2	1 end 20/2
4 ends 20/1	1 end 40/2	3 ends 16/1
3 ends 20/2	1 end 40/2	4 ends 16/1
3 ends 40/2	1 end 40/2	3 ends 300/1 Rayon
	1 end 16/1	3 ends 300/1 Rayon
	3 ends 100/1	2 ends 100/1
	2 ends 100/2	3 ends 100/2

Braided Cover

A small amount of covered rubber thread, found particularly in imported products, is effected on a braiding

[1] All rights reserved by the author.
[2] Textile designer, Russell Mfg. Co., Middletown, Conn.
[3] See India Rubber World, July 1, 1934, p. 36.

RUBBER THREAD TABLE
Weight Per End @ 144 Yards

	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	54	75
1	.4153	.3422	.2884	.2457	.2119	.1846	.1622	.1437	.1282	.1150	.1038	.0942	.0858	.0785	.0721	.0570	.0295
2	.8306	.6865	.5769	.4915	.4238	.3693	.3245	.2874	.2564	.2301	.2077	.1884	.1716	.1570	.1442	.1139	.0591
3	1.2459	1.0297	.8652	.7372	.6357	.5538	.4867	.4311	.3845	.3451	.3115	.2825	.2574	.2355	.2163	.1709	.0886
4	1.6613	1.3729	1.1536	.9830	.8476	.7383	.6489	.5748	.5127	.4602	.4153	.3767	.3430	.3140	.2884	.2279	.1181
5	2.0766	1.7162	1.4421	1.2287	1.0595	.9229	.8112	.7185	.6409	.5752	.5191	.4709	.4290	.3925	.3605	.2849	.1477
6	2.4919	2.0594	1.7305	1.4745	1.2714	1.1075	.9734	.8622	.7691	.6903	.6230	.5651	.5149	.4711	.4326	.3418	.1772
7	2.9072	2.4026	2.0189	1.7202	1.4833	1.2921	1.1356	1.0060	.8973	.8053	.7268	.6592	.6007	.5496	.5047	.3988	.2067
8	3.3225	2.7459	2.3073	1.9660	1.6952	1.4767	1.2979	1.1497	1.0255	.9204	.8306	.7534	.6865	.6281	.5768	.4558	.2363
9	3.7378	3.0891	2.5957	2.2117	1.9071	1.6613	1.4601	1.2934	1.1536	1.0354	.9345	.8476	.7723	.7066	.6489	.5127	.2658
10	4.1531	3.4323	2.8841	2.4575	2.1189	1.8458	1.6223	1.4371	1.2818	1.1505	1.0383	.9418	.8581	.7851	.7210	.5697	.2953
11	4.5685	3.7756	3.1725	2.7032	2.3308	2.0304	1.7846	1.5808	1.4100	1.2655	1.1421	1.0359	.9439	..8636	.7931	.6267	.3249
12	4.9838	4.1188	3.4610	2.9490	2.5427	2.2150	1.9468	1.7245	1.5382	1.3805	1.2459	1.1301	1.0297	.9421	.8652	.6836	.3544
13	5.3991	4.4621	3.7494	3.1947	2.7546	2.3996	2.1191	1.8682	1.6664	1.4956	1.3498	1.2243	1.1155	1.0206	.9373	.7406	.3839
14	5.8144	4.8053	4.0378	3.4405	2.9665	2.5842	2.2712	2.0119	1.7946	1.6106	1.4536	1.3185	1.2013	1.0991	1.0094	.7976	.4135
15	6.2297	5.1485	4.3262	3.6862	3.1784	2.7688	2.4335	2.1556	1.9227	1.7257	1.5574	1.4126	1.2871	1.1776	1.0815	.8546	.4430
16	6.6450	5.4918	4.6146	3.9320	3.3903	2.9533	2.5957	2.2993	2.0509	1.8407	1.6613	1.5068	1.3729	1.2561	1.1536	.9115	.4725
17	7.0603	5.8350	4.9030	4.1777	3.6022	3.1379	2.7579	2.4430	2.1791	1.9558	1.7651	1.6010	1.4587	1.3347	1.2258	.9685	.5021
18	7.4757	6.1782	5.1914.	4.4235	3.8141	3.3225	2.9202	2.5867	2.3073	2.0708	1.8689	1.6952	1.5446	1.4132	1.2979	1.0255	.5316
19	7.8910	6.5215	5.4798	4.6692	4.0260	3.5071	3.0824	2.7304	2.4355	2.1859	1.9727	1.7893	1.6304	1.4917	1.3700	1.0824	.5611
20	8.3063	6.8647	5.7683	4.9150	4.2379	3.6917	3.2446	2.8741	2.5637	2.3009	2.0766	1.8835	1.7162	1.5702	1.4421	1.1394	.5907

machine. The result is a very smooth, well covered product, excellent for weaving. It shows no tendency to twist or kink, and the products in which it is used will not curl or twist. The extensive use of braided covered rubber thread is prohibitive, except in highest-grade products, on account of cost.

Thread Table

The accompanying rubber thread table has been compiled to effect a saving of time in calculating the amount of square-cut rubber required for any given number of ends from 1 to 20, inclusive, at 144 yards or one gross, and for common numbers from No. 20 to No. 75. The equation that is used to determine these constants is:

$$\frac{166.1256 \times \text{number of ends}}{\text{square of count}}$$

To Use Table

Rule: Multiply the weight of the number of ends of the given size rubber, as shown in the proper place in the table, by the rubber ratio for weight per gross.

Example: What weight of rubber thread will be required per gross webbing for a fabric employing 18 ends No. 44 rubber with a rubber ratio of 37½%?

Solution: The weight of 18 ends as shown under the column for No. 44 rubber is found to be 1.5446; therefore, 1.5446 x 0.375 (37½%)= 0.579-pound.

Elemental Time Analysis

(*Continued from page* 34)

be correct for this necessary element as it appears in the building of every tire size on this type machine. Similarly, other elements throughout will be found to repeat on various other tire sizes, under exactly similar conditions, and so should carry the same standard allowances in all such cases.

Other elements will be similar but perhaps vary properly as to time due to some such factor as the tire size. "Assemble bands and line up" would come in this class, but the allowances for this element on each tire size built on the same type machine should be in definite relation, one to the other. "32. Break tire loose from core," would also come under this class of element.

By standardizing elements in this manner not only for one given job but also as they appear and repeat between similar jobs made on the same equipment, elemental time analysis gives the added advantages: first, of having all standard times or rates set in proper relation to each other; second, of constantly decreasing the necessity of making complete studies on every job as the standards on certain elements are already established; and finally, studies are gradually eliminated altogether, except for new or unusual jobs.

Under the present national economic condition with codes and various governmental regulations affecting manufacturing industry, with labor and management striving for a better understanding of each other, and at the same time seeking to protect their own interests, none but eminently fair and thoroughly practical methods should be considered in any manufacturing organization. Elemental time analysis stands out as a highly improved aid to both management and labor, guaranteeing to both impartial and fairly determined wage rates; and as a sound foundation upon which can be built planning, scheduling, and complete production control.

Para-Graphs

ELECTRIC NUMBERING DISK. A very practical hand electrical device for branding tires with numbers comprises a resistance coil encased in dielectric material with a metal disk cast about the coil bearing raised characters on its outer circumference. Wire connections through the handle serve to heat the metal disk to branding temperature.

MOLD CLEANING SOLUTION. The coating that forms on metal vulcanizing molds is removable by treatment with an aqueous solution containing chromic acid of sufficient strength to oxidize and disintegrate the film; after which operation the mold is rinsed with water to remove the solution and any remaining film.

TOBACCO PIPE. This pipe comprises a stem, mouthpiece, and an elastic coupling sleeve fitting over the adjacent ends for holding them together and for permitting relative angular movement between the ends and the mouthpiece.

Rubber Cements—II[1]

Uses of Rubber and Latex Cements

Adhesives

ONE important use for cement as an adhesive is for a bond between rubber surfaces, as in the manufacture of boots and shoes, hospital supplies, tires and tubes to some extent, and many hand-made articles. Also the use of rubber cement as an adhesive between rubber surfaces is important in repairing tires and tubes.

When using cement for repair purposes, the preparation of the surfaces to be cemented is quite as important as the cement used. In putting a patch on an inner tube the portions to be cemented should be well roughened, using coarse sandpaper or a metal scraper. They should then be given 2 or more thin coats of cement, allowing each to dry. The best patches are made from vulcanized sheet rubber coated on one side with a layer of unvulcanized rubber, the unvulcanized side being placed next to the tube. The patch should be held on the tube with a clamp, and the whole heated to cause vulcanization. The same general procedure is followed with other types of repairs. If a self-vulcanizing cement is used and it is not feasible to heat the article, the parts should be clamped together and held under pressure until vulcanization occurs. In case of a patch on an inner tube, pressure can be applied by inflating the tube in the casing.

Good adhesion can be obtained between rubber and cotton and between rubber and some other textiles. It is common practice first to friction the fabric on a calender. A substitute for frictioning consists of running the fabric through a bath of rubber or latex cement. Either of these methods leaves the meshes of the fabric filled with rubber so that with further coating the adhesion is really between rubber surfaces, and the process may be carried out the same as a rubber to rubber adhesion.

Adhesion between rubber and leather cannot be made so easily as between rubber and cotton because leather cannot be heated to the usual vulcanizing temperatures. It is quite common to use cements which will self-vulcanize without heating above room temperature. The desirability of making the leather surface to be cemented very rough and fuzzy before applying the cement cannot be emphasized too much.

Rubber soles for cementing to leather soles have become popular in the past few years. In one type the sole is coated with a layer of tacky rubber, and the cement which accompanies it appears to be non-vulcanizing. In another type the bond is made by the equivalent of a 2-part vulcanizing cement. The sole is coated with one part of cement as, for instance, formula 5A,[2] the solvent, of course, having evaporated. The cement accompanying the sole is equivalent to formula 5B. The 2 parts, 5A and 5B, come into contact in putting on the sole, and vulcanization gradually takes place.

Rubber does not adhere easily to metals, but by using certain combinations of metal and rubber satisfactory adhesion can be secured. Rubber does adhere fairly well to brass and in particular to brass of a composition of approximately 75% copper and 25% zinc. The following cement formula is for attaching rubber to brass:

CEMENT NO. 7

Ingredients	Parts by Weight
Rubber	100
Antioxidant	1
Stearic acid	1
Zinc oxide	5
Carbon black	40
Sulphur	5
Vandex	0.5
Captax	1
Solvent	1000

This cement requires about 30 minutes at 288° F. for vulcanization. If adhesion is desired between rubber and steel, the steel may first be plated with brass and then treated the same as though it were solid brass.

Another method of securing adhesion between steel and rubber is by using a thermoprene cement. This material is derived from rubber by the action of certain reagents such as phenol sulphonic acid. There are several other methods for securing adhesion between rubber and metals and many patents covering special materials and processes.

Binders and Sealing Compounds

A rubber or latex cement is often used as a binder for other materials. Many packings, principally of asbestos fiber, contain rubber as a binder; some brake lining compositions employ rubber for this purpose. In the shoe industry it is used as a binder for felt and cotton insoles.

One of the large uses for latex cement is as a sealing material in the manufacture of tin cans. The cement, applied to the surfaces of the metal, is forced into the joint during the rolling process used for making the can.

Manufacture of Dipped Goods

In making dipped goods a form of wood, glass, porcelain, or aluminum is dipped into a rubber or a latex cement, lifted out, and the adhering solution allowed to dry. This operation is repeated until the rubber coating reaches the desired thickness.

If a non-vulcanizing rubber or latex cement is used, the product may be vulcanized by dipping it into a 2% solution of sulphur chloride. Carbon bisulphide is considered the best solvent for this purpose. The time required for vulcanization is from about 30 to 45 seconds. After vulcanization the product should be dipped in an ammonium hydroxide solution to neutralize the excess of sulphur chloride and check the vulcanizing before it has gone too far.

If a vulcanizing cement is used, the product may be vulcanized with heat. In general, products vulcanized with heat are likely to have better aging characteristics than those vulcanized with sulphur chloride.

The process of making dipped goods, although simple in principle, requires great care and attention to details to obtain a satisfactory product. The cement must be uniformly smooth and of the proper consistency. Dipping must be done with care, the drying process carried out at the proper rate, and precautions taken to avoid any dirt or dust.

[1] Continued from INDIA RUBBER WORLD, July 1, 1934, pp. 27-29, 38. Abridged from "Rubber Cements," Letter Circular LC 411, Apr. 30, 1934. United States Department of Commerce, Bureau of Standards, Washington, D. C.

[2] See INDIA RUBBER WORLD, July 1, 1934, p. 29.

Rubberizing Fabrics

Rubber-coating of fabrics for raincoats, balloons, sheeting, etc. is an important part of the rubber industry. The rubberizing is usually done by the spreading process. The untreated cloth is run from a roll into a spreading machine where rubber cement is distributed evenly over the surface by a spreader knife. The cloth is then passed over a hot plate to evaporate the solvent and then is re-rolled. It is passed through the machine as many times as may be necessary to obtain the desired thickness of rubber. If a non-vulcanizing cement is used, vulcanization is produced by passing the cloth through a chamber containing sulphur chloride vapor, after which it is neutralized to prevent "tendering" of the fabric. If a vulcanizing cement is used, the cloth may be vulcanized with heat by hanging in a heated chamber or by rolling it between liners and vulcanizing in steam.

If vulcanized latex is used for spreading, no vulcanizing treatment is necessary. This makes the process well adapted to use for silk, rayon, etc. to avoid damage to the fabric or injury to delicate colors.

Production of Rubber Cement

Although various types of rubber cements can be purchased ready mixed, circumstances arise under which the individual may wish to prepare cements in lots ranging from a few ounces to a few gallons at a time. The first difficulty likely to be encountered is in purchasing ingredients. These are available in only a few of the larger cities, and the dealers for the most part are accustomed to selling to manufacturers in large lots, rather than at retail in small lots.

The second difficulty which may be met is in milling or "breaking down" the rubber. This work requires the use of a rubber mill or internal mixer. This difficulty may be partly overcome with a solvent activator. It is not known whether any firms regularly engage in the business of supplying milled or "broken down" crude rubber in small lots, but many small firms are willing to mill occasional lots of rubber for a reasonable consideration. Some users obtain a sufficient supply of milled rubber to last for several months and make up cement in small lots as needed.

The third difficulty which may be met is in mixing the cement. This can be done by hand, but if large or frequent batches are required, hand mixing is likely to be tedious and time-consuming. Mechanical mixing can be accomplished by various laboratory mixing, stirring, or shaking devices, or by small dough mixers or churns designed along the same lines as the large-scale commercial cement mixing equipment.

To offset these difficulties, there may be certain advantages in making rubber cement on a small scale. The uses of rubber cement are so multitudinous that there may be purposes which cannot be served so well by standard commercial cements as by a cement made up for the particular job. Furthermore there may be cases where the characteristics desired for a cement cannot be specified in advance, but where it is necessary to experiment until a product of optimum characteristics is obtained. Any development process such as this can often be best served if the investigator has in hand the necessary ingredients for a cement and can blend them in various proportions until the desired results are achieved. In still other cases it may be desirable to make rubber cement on a small scale for the reason that the cost of ingredients for making a cement may be much less than the price of the same product, ready mixed, when purchased at retail.

Rubber and the Machine Age

(*Continued from page* 32)

die head on to the receiving conveyer. Rubber covered wire for insulation purposes is made in large quantities as well as solid slabs of special cross-sectioned shapes for cutting off to predetermined lengths. Sometimes the receiving belt at the die head is fitted with a guillotine type of knife timed to a fixed cycle for the severing operation.

Stock is fed to the tubing machine by gravity roller conveyers or other automatic means which allow a continuous and practically unlimited strip to emerge from the die head. Modern improvements in mechanism, feeding devices, and receiving belts have cut the number of operators required for manning an extruding machine to a minimum and have given better uniformity to the quality of output. Many types of tubers have been conceived; one of which actually hammers or swages the edges of a flat rubber strip together as the sheet is formed to circular cross-section over a small mandrel. Freshly cut stock is very essential with this type of tube manufacturing equipment in order to obtain good adhesion of the lapped or butted ends.

Another development in tube forming machines utilizes multi-stranded wires which act as mandrels for sheeted material as it is fed in 2 layers so as to surround the wire cables while they are drawn through tube forming and cutting rolls. The flexible wire cable used as a core also acts as a supporting means for winding the formed tubes on to curing drums. After vulcanization the wire cores are removed.

An interesting development and one which has permitted the manufacture of heavy-duty hose is the modern lead press extruder. Rubber covered woven fabric, first coated by passing through the regular tuber, is drawn through a lead press having a round die head opening on the exit side of the machine. The rubber covered hose, coated with lead during its passage through the machine, emerges from the die metal clad and air cooled. It is then wound on large drums and loaded on to a vulcanizer car fitted with a pressure system to inflate and hold the hose against the inner wall of the lead sheath under internal pressure during the cure. After curing, the lead covering is automatically slit and removed from the hose and fed into chopping machines. The small pieces of lead are then remelted into billets ready for replenishing the lead press melting pot.

Rubber Industry Progressive

Throughout the world a great army of technically trained men are steadily pushing forward to harness mechanically, still further, this romantic, plastic material which has done so much to bring about luxurious living in the machine age. When one looks back over the tremendous progress already made, the success of their efforts is a foregone conclusion.

The Purchasing Department

Its Functions, Organization, Operation, and Records in a Rubber Factory

J. H. Coulahan

A VERY important function is performed in business organization by purchasing agents, as purchases must be made before manufacturing or selling operations can be undertaken. They must be used in quantities that, on the one hand, are sufficient to prevent interruption of operations, and on the other, not to overstock, lest capital be wastefully employed. They also must be bought at a proper price. Selling prices often are beyond control, and profits depend on the wisdom displayed by the purchasing department in buying raw materials.

Buyers as well as sellers are required to form a market. This point is not always recognized, for, as a rule, much the greater emphasis is placed by students of business upon the selling side of marketing activities.

Commodities purchased by the purchasing department divide into 3 general types:

1. Raw materials, as rubber, whiting, clay, colors, etc.
2. Semi-manufactured goods, as bolts, machine fittings, packing cases, etc.
3. Supplies and equipment; office stationery, furniture and fixtures; machine tools.

The aim of the purchasing department in securing these types is:

1. To secure suitable goods.
2. To make satisfactory agreement regarding price.
3. To make satisfactory credit arrangements.
4. To assure delivery when required.
5. To assure the reliability of the vendor.

Blanket contracts are customary in the rubber field on raw material requirements covering large quantities. These are drawn up on the basis of a guaranteed price based on maximum and minimum requirements.

Selection of Raw Material

In the rubber industry close cooperation with the factory is necessary, as a product must be supplied which will conform with certain standards. The laboratory is an important factor in this province and must approve all material before purchase, if necessary drawing up specifications and testing samples, particularly as to physical properties.

Some raw materials require special attention. Coal is often purchased by analysis as it is the cost per heat unit rather than the cost per ton which determines the wisdom of purchase. Moisture and ash content and heat producing ability all must be considered. For instance, an analysis has shown the following:

	Coal A	Coal B
Volatile matter	31.82	37.26
Fixed carbon	59.59	38.56
Ash content	8.59	10.31
Moisture	9.90	13.87
Heating value B.T.U.	13,320	10,985
Cost delivered in car	$7.17	$6.22

Corrected for Comparison

Coal	Cost per Ton	B.T.U.	Ash Content	Corrected B.T.U.	Cost per Million B.T.U.
A....	$7.17	13,320	8.59%	12,176	$0.29
B....	$6.22	10,985	10.31%	9,853	.31

Thus Coal B actually costs more in terms of its value for steaming purposes than Coal A. In addition the cost of unloading, storing, and firing, also cost of ash disposal would be greater for Coal B.

Coal is subject to unusual variations in quality; so some purchasing agents little rely on analysis, but the above shows that relative value should often govern in making selection rather than mere comparison of prices.

An important problem of administration is the selection of machinery. A permanent commitment of funds is generally involved. Once the machinery is placed in the plant there is little chance to realize upon the investment except by wearing the machine out during the course of operating. If improved devices are introduced by competitors, only a small portion of the original investment can be salvaged if it is removed or destroyed.

Under the stress of competition every possible chance to reduce operating costs by possible improvements must be carefully scrutinized. The only precaution is assurance that all costs of making the change are given due consideration in the calculations.

Furniture and fixtures should be standardized as far as possible as this policy simplifies and economizes the work of the purchasing department and should be judged solely from the standpoint of service for each dollar expended.

Stationery and printed forms can be overdone and should be carefully examined and investigated before ordered printed. Forms already in use may prove adequate for the need or may possibly be mimeographed or typed by the office organization.

The essential feature of control over supplies is the careful predetermining of what is needed and buying in as large quantities as is practical, based on ordinary rate of consumption.

The close contacts with the market which the purchasing department maintains makes it of great service to the organization. If awake to its opportunities, it may often make suggestions resulting in extending sales operations or making internal economies.

The question of how far the department should go in making substitutions is likely to be troublesome. No doubt exists but that materials are often specified which are not the best that can be chosen. Specials are very often requisitioned when standard goods in the market are satisfactory in every way and cost less.

Selection of the concern from which the material is bought should be entirely in the hands of the purchasing department. It is seldom necessary to specify within such narrow limits that only one concern can meet the conditions except in the case of some special equipment or where a monopoly exists.

Purchasing must be in close contacts with other departments. The financial department must supply the funds. The traffic department attends to the transportation arrangements. The factory organization is vitally interested in the requisition of raw materials.

Lack of foresight in requisitioning may lead to over-investment in inventories or delays and lost opportunities for profit making.

Coordination is assisted by each department preparing periodic estimates of what it proposes to accomplish. This budgeted control enables the purchasing department to proceed with confidence, formulating its plans on probable raw material requirements.

Organization of the Department

Besides securing offers from sellers, selecting from among these, and drafting and closing purchase contracts, much record keeping is necessary. Information must be compiled regarding supply sources, also concerning general business conditions to aid in forecasting price and supply trends. Then, too, records must be kept of past orders and prices paid, and reference files of quality and quantity standards must be maintained.

Negotiations must always be reduced to written form, and this policy means the clerical routine of writing purchasing orders, conducting routine correspondence, tracing orders, caring for invoices and adjustments, etc.

Supervision of inspecting incoming purchases is more or less delegated to some factory department.

Close coordination with the storekeeper is likewise essential to check on inventory conditions.

Attitude Toward Vendors

Satisfactory relations with salesmen of vendors contribute much to the effectiveness of the purchasing department and should be a matter of policy. The good will of a concern can be built up or destroyed through the actions of the purchasing department as much as through those of the selling end. In abnormal times when the buyer must beg favors, the value of happy relations with the vendors can easily be seen, but they are of tangible worth at all times and unless cultivated consistently are not likely to be present when needed most.

This point brings up the matter of policy buying where, because of insistence by the sales department, pressure is brought to give business to some particular vendor. This demand places the purchasing department in a delicate position. The sales manager sees the possibility of losing trade and pleads the customer's case. The only choice open to the purchasing department is to decide in the manner which seems best for the organization. If the commodity offered is equal to competitors', the desire to reciprocate should receive some weight, but if it means accepting inferior goods or buying on less advantageous terms, the practice is questionable.

Routine Purchasing Procedure

The routine of the department must be planned so it is neither inelastic nor over-elaborate, in other words, to secure the utmost of efficiency consistent with the cost. For instance, a procedure for handling a purchase order which costs a minimum of $1.00 per order to operate obviously is of questionable value for a 50¢ purchase; yet during the depression this condition held in many large concerns.

Many activities in the purchasing department can be standardized, but the question of cost is important here, and the prices of goods are seldom, if ever, standardized. The matter of inventories can be approximately set. However practically all purchasing operations are of a clerical nature and can be standardized. These comprise handling purchasing orders and adjustments, providing inspection facilities, and approving invoices.

Purchase Requisition

The purchase requisition originates with some central force other than the purchasing, the latter being responsible for its confirmation, thus giving a double check. This confirmation, however, means investigation as to desirability of the purchase, possibly making substitution and even canceling. See Figure 1.

Purchase Order

The requisition is ordinarily very brief, merely listing the quantity and kind of goods required. Placing an order involves 3 acts: preparation, negotiation, and recording. The second is usually left to the judgment of the buyer and probably cannot be standardized. The first and third are routine. See Figure 2.

Receiving and Inspecting

One person in the organization should be responsible for the receipt of all goods. This employe performs an important function in that he supplies the information required for closing the purchase transaction; so the purchasing department can supply the authority for approving the claim for payment.

The receiver should be supplied a copy of the purchasing order with the actual quantities left blank; so no superficial check be made. Goods should be inspected before the receiving clerk reports to the purchasing department. See Figure 3.

BOSS MANUFACTURING CO.
NEW YORK, N.Y.

PURCHASE REQUISITION

PURCHASING DEPT. *REQ. NO.*.....

KINDLY PLACE ORDER FOR THE FOLLOWING:

Issued by.....*Stores Clerk*
Approved by.....*Supt.*

QUANTITY	DESCRIPTION

Fig. 1. Purchase Requisition

Invoices

The receiving department's certification supplies the authority to the purchasing department for approval of the invoice. Several departments are interested in the invoice, the vouchers payable department and the stores clerk responsible for perpetual inventory records. A house copy of the invoice can be provided for the stores clerk, or he can be given the duplicate copy.

A standard invoice form recommended by the National Association of Purchasing Agents has the hearty support of the United States Department of Commerce in its campaign for simplified practices, and the form has been widely adopted.

Prompt handling of invoices is of paramount importance if cash discounts are to be taken. The purchasing department takes the responsibility to a large extent that such invoices reach the paying department within the discount limit date.

All the above is based on the assumption that the goods received were in agreement with the invoice, but in practice many irregularities arise for which provision must be made. Goods sometimes arrive damaged, or the count shows an overage or a shortage. If the responsibility rests with the carrier, the matter is usually adjusted by the traffic department.

Custom or common consent in many lines has decreed that a reasonable percentage of shortage or overage is permissible. Possession of goods for which payment is

BOSS MANUFACTURING CO.
NEW YORK, N.Y.

PURCHASE ORDER

To..... Date.....
Address..... P.O. No.....

PLEASE MAKE SHIPMENT DESCRIBED BELOW

Ship on or before.....
Via.....
To..... Terms.....

QUANTITY	DESCRIPTION	PRICE	AMOUNT

BOSS MFG. CO.
Per.....
Purchasing Agent

Fig. 2. Purchase Order

held up often places the buyer in an advantageous position when the vendor is tardy in making adjustments.

Departmental Records

The records vary with the nature and the size of the business, but certain data must always be kept in some convenient form. The following list suggests the more important.

REFERENCE FILES

Supply sources
Vendor files
Records of past purchases
Price records
Specifications
Investigations and special reports
General correspondence

RECORDS OF CURRENT OPERATION

Current invoices
Outstanding orders
Goods received and inspections
Unadjusted claims

All purchasing departments need a file concerning possible sources of supply for materials. Trade circulars and catalogs are the best. Special catalogs by various commercial agencies have been published in book form, for instance, "Sweets Catalog" and "Thomas' Register of American Manufacturers." Advertising matter in trade journals is a valuable source, and it is often advisable to maintain a clipping file to preserve such information.

The problem of filing source information is not difficult.

RECEIVED AND INSPECTION REPORT

Purchase Order No..... No.....
Requisition No..... Date.....

THE FOLLOWING MATERIALS HAVE BEEN RECEIVED, ACCEPTED AND SENT TO STORES

ARTICLE		
LOT No.	DESCRIPTION	QUANTITY

Received by.....
Inspected by.....

Fig. 3. Receiving and Inspecting Form

It generally can be filed on shelves, and a commodity index of the catalog file made up.

VENDOR FILE. As a means of supplementing the general source file, it is worth while to maintain a record giving more specific information concerning vendors from whom purchases are more frequently made.

RECORD OF PAST ORDERS. A file copy of each order prepared when the order is written and filed numerically provides a cheap and convenient record. When used in connection with the vendor record, past orders can be quickly found if the name of the vendor, the number of the order, or even the approximate date of the order is known. Usually to save valuable filing space it is wise to keep past orders in the active files only for a short time, after which they are transferred to a "dead file" where they may be found if required at any time.

PRICE FILE. A good, but simple price file is essential. A separate card for each commodity should be used. Quotation, the source from which obtained, and the date entered are necessary. Sometimes a loose-leaf record for desk use is more convenient.

SPECIFICATION FILES. Material standards are made a matter of record by means of specifications, and the purchasing department should be provided with a complete file. This insures against misunderstandings as to material requirements and eliminates the necessity of describing goods in detail on the requisition. Specifications vary widely. In some cases only the barest description is necessary, sometimes many typewritten pages are needed, supplemented by elaborate drawings.

RECORDS OF CURRENT OPERATIONS. This file is necessary to trace and secure prompt deliveries. A copy of each order is placed in an unfilled order file, in date order, and thus serves as a tickler file for tracing in case of delayed acknowledgment. The order is removed when the goods are received. A record of current invoices is necessary to follow them closely and insure prompt payments.

Reports of the purchasing department include those pertaining to buying operations, those concerning payment of vendors' accounts, and those pertaining to inventory. These vary according to the amount of business handled. A summary of buying operations in a monthly report and a daily summary of purchases with a report on claim adjustments are all of value.

Fluctuations in business conditions affect the purchasing department in that they may dictate the amount of goods to be purchased. Price variations are most likely to cause concern. Sometimes in the case of an essential material restriction of the supply may mean procuring it at any price to avoid closing the plant.

Knowledge of the market and of market practices is necessary for the executive in charge of purchasing, for, difficult as it is to measure exactly, inefficiency in the purchasing department is very soon reflected in the statement of earnings.

THERMOPLASTIC INSULATION SPLICING. An improved method of joining thermoplastic insulation of submarine electric cables comprises applying to the surfaces to be joined steam or water vapor to raise their temperature, bringing them into contact in heated condition, and molding the union. The main bulk of the thermoplastic insulation may contain about 0.75% by weight of water; whereas the water content of that adjacent to the joint may be increased conveniently to 1.5, 1.8, or even 3%. This increase of water content at the joint will generally result in a stronger and better joint.

EDITORIALS

Rubber Labor Board

ALTHOUGH the new labor board established by order of Administrator Johnson will begin to function after the Akron and San Francisco strikes have been settled, it will be in a salient position in the future to hear labor disputes and possibly settle them before walkouts occur. The duties of the board are clearly defined in the administration order which follows:

"Said labor board shall receive and adjust or determine all labor complaints and labor disputes which may arise in the rubber manufacturing and rubber tire manufacturing industries, in accordance with such rules and regulations as may be established by the impartial chairman, from time to time, provided that such rules and regulations shall have been approved by the administrator."

It is obvious that the intent of the above order is to provide a common meeting ground where rubber manufacturers and rubber union men will be able to settle their difficulties equitably.

Willard E. Hotchkiss, the permanent impartial chairman of the board, is well qualified for the position. He is a college man with a judicial mind who has specialized in economics, political science, and industrial management and has served on several labor adjustment boards. His background, associations, and general attitude toward the NRA regulations are ample assurance that the interests of the whole rubber industry will be impartially served.

Native Rubber and the Dutch

IF ANY doubt existed that potential output of native rubber had been greatly exaggerated or that at best only a small part of it could be tapped because of the labor problem, this would be largely dispelled by the recent huge native shipments which for the 3 months March to May, 1934, averaged over 20,000 tons monthly.

It may be suggested that these enormous shipments were largely due to unloading of stocks or last-minute rush of remillers to get supplies before restriction got under way, and that the natives could not have kept this rate up for long. This may be so. Yet it is recalled that early in 1925, when Europeans were becoming disagreeably aware of Dutch native rubber, convincing proofs were offered to show that the annual exports could never exceed the 56,000 tons exported in 1924. But before the recent slump temporarily stemmed the tide of native rubber, the figure had been doubled.

Again, when toward the end of the second quarter of 1933 natives, encouraged by rising prices, commenced doubling and trebling their former exports, it was argued that this increase would not continue for any length of time. Nevertheless native exports over the 12 months June, 1933, to May, 1934, have mounted to 180,000 tons against 62,000 tons in 1932!

The native rubber is there, and if the market or the remillers ask for more, more will appear. The question, then, is how can the Dutch control native rubber?

The problem undoubtedly is most difficult for the Dutch and will become more so if prices rise considerably. Disgruntled agitators will try to stir up trouble, while natives and Chinese are adept at finding ways and means of evading inconvenient regulations.

On the other hand the inclusion of practically all rubber producing countries in the regulation scheme has reduced the chances for smuggling to a minimum. Again, the natives are said to be wholeheartedly in favor of restriction so that if the duty is abolished, as it may be in certain districts, they may prove more amenable than is at present considered possible by the skeptical.

Lastly and most important of all, there is every reason to believe that the Dutch Indian Government will not leave anything undone in carrying out its undertaking, and that prompt and suitable action will be taken on the slightest indication that attempts are being made to evade control.

Firestone on NRA

HARVEY S. FIRESTONE, SR., now testifies that NRA tire manufacturers' and dealers' codes haven't meant a thing. Pointing to the current preposterous tire guarantee battle, he says, "If the NRA could do anything to eliminate bad practices it would have stopped that dispute."

And there's only one way Washington can answer that. By halting the guarantee warfare. If it doesn't do that and swiftly, it can expect to see Harvey's verdict become the general one. *Akron Beacon Journal.*

EMPLOYERS MUST BE INDUCED TO HIRE A PROPER PROportion of handicapped persons, or the great bulk of such workers will have to be pensioned and kept in idleness at enormous cost to the public, the special NRA commission, appointed to study the effect of codes upon employment of the physically or mentally handicapped, reported last month.

What the Rubber Chemists Are Doing

Fluorescence of Rubber and of Compounding Ingredients[1]

V. N. Morris[2]

THE primary objects of the present paper are (1) to provide information regarding the fluorescent colors of antioxidants, softeners, accelerators, and inorganic pigments, with special reference to products of American manufacture; (2) to supplement the information previously published with respect to the fluorescent colors of zinc oxides and show results bearing on the question of the cause of the difference between various zinc oxides; and (3) to show the relation between the intensity of fluorescence and the state of cure of certain rubber compounds.

The fluorescence of accelerators, softeners, and antioxidants was examined and found to be as recorded in the following tables.

The results obtained with a number of accelerators of American origin are shown in Table 1.

TABLE 1. FLUORESCENCE OF ACCELERATORS

ACCELERATOR	FLUORESCENT COLOR*
Triphenylguanidine	Muddy gray
Diphenylguanidine (D. P. G.)	Light purple
Di-*o*-tolylguanidine (D. O. T. G.)	Purple
Phenyl-*o*-tolylguanidine	Light bluish purple
Diphenylguanidine and 2,4-dinitrobenzothiazyl sulphide (Ureka)	Reddish black
2,4-Dinitrobenzothiazyl sulphide	Appears black
Tetramethylthiuram monosulphide (Monex)	Appears black (trace of purple)
Tetramethylthiuram disulphide (Tuads)	Deep purple
2-Mercaptobenzothiazole (Captax)	Reddish brown
Ethylidene aniline (Vulcone)	Light brown
Thiocarbanilide	Purple
Hexamethylenetetramine	Light purple
Triethyltrimethylenetriamine (Trimene Base)	Dark yellowish green
Triethyltrimethylenetriamine and stearic acid (Trimene)	Light green
Zinc butylxanthate	Very deep purple
Zinc dimethyldithiocarbamate (Zimate)	Dirty purple
Piperidinium pentamethylenedithiocarbamate (du Pont No. 552)	Appears black
Carbon disulphide derivative of methylene dipiperidine + 5% oleic acid (Pipsol-X)	Appears black

*Samples appearing black obviously show neither visible fluorescence nor reflection; samples showing a purple color are exhibiting reflection with little or no fluorescence.

Table 2 shows the fluorescent colors exhibited by several softeners commonly used in the rubber industry. It was observed that the fluorescent colors of the softeners are lighter and more intense than the natural colors in many cases.

TABLE 2. FLUORESCENCE OF SOFTENERS

SOFTENER	FLUORESCENT COLOR
Pine tar	Dark yellow-green
Refined asphalt	Dark yellow-brown
Stearic acid	Light bluish violet
Mineral rubber	Purple (appears nearly black)
Rosin oil	Light blue
Rosin	Intense light blue
Mineral oil (medium process)	Very light blue

The fluorescent color has been used in this laboratory in confirming the identity of softeners extracted from products of unknown composition.

TABLE 3. FLUORESCENCE OF ANTIOXIDANTS

ANTIOXIDANT	COLOR IN DAYLIGHT	FLUORESCENT COLOR
Acetaldehyde aniline (VGB)	Tan	Dull greenish brown
N,N'-Diphenylenediamine (Stabilite)	Straw	Red-violet
Hydroquinone	White	Blue-violet
Condensation product of aniline and a ketone (Flectol)	Dark brown	Greenish yellow
Aldol-α-naphthylamine (Age-Rite Resin)	Reddish brown	Dull brownish green
Phenyl-β-naphthylamine (Age-Rite Powder)	Light brown-gray	Light blue (glowing)
Phenyl-β-naphthylamine (Neozone D)	Faintly grayish pink	Light blue-violet (glowing)
Phenyl-α-naphthylamine (Neozone A)	Purplish pink	Light blue (glowing)
Phenyl-α-naphthylamine (92.5%) and *m*-toluylenediamine (7.5%) (Neozone C)	Chocolate	Violet (glowing)
Di-β-naphthyl-*p*-phenylenediamine (Age-Rite White)	Brownish white	Light blue

A series of results obtained with commercial antioxidants is shown in Table 3. The fluorescent effects with these products were often quite pronounced, as evidenced by the designation "glowing" that is used in certain cases.

A large number of common inorganic compounding ingredients were examined of which only zinc oxide shows a characteristic effect. The fluorescent colors of various commercial brands of zinc oxide permit them to be distinguished from one another. Particle size is found to govern the fluorescent colors of a series of zinc oxides all made from the same original material. After low-temperature ashing of rubber stocks containing various zinc oxides it is possible to identify the zinc oxide used, provided it has a sufficiently characteristic fluorescent color. Well-vulcanized rubber shows a yellow fluorescent color of fairly strong intensity; while decidedly undercured rubber fluoresces but slightly. In general no definite relation between optimum physical properties and the intensity of fluorescence is apparent. Rubber loses its capacity for fluorescing almost completely upon being exposed to direct sunlight for one hour.

TABLE 4. FLUORESCENCE OF ZINC OXIDES

SAMPLE	GRADE OR TYPE OF OXIDE	MANUFACTURER	FLUORESCENT COLOR
1	Kadox	N. J. Zinc Co.	Deep purple
2	XX-Red-4	N. J. Zinc Co.	Light yellowish brown
3	U. S. P.	N. J. Zinc Co.	Light brownish purple
4	U. S. P.	Intern. Lead Refining Co.	Grayish green
5	French process	Intern. Lead Refining Co.	Brown tinged with purple
6	Electric furnace process	St. Joseph Lead Co.	Brownish purple
7	American process	Intern. Lead Refining Co.	Bright yellow tinged with brown
8	Azo ZZZ (paint grade)	Am. Zinc Oxide Co.	Light yellow
9	Chemically pure	Mallinckrodt Chem. Works	Dull gray

[1] Abridged from *Ind. Eng. Chem.*, Jan., 1934, pp. 107-111.

[2] Firestone Tire & Rubber Co., Akron, O.

Rubber Testing and Specifications

AT THE 37th annual meeting of the American Society for Testing Materials, held at Atlantic City, N. J., June 25 to 29, 1934, important developments in the rubber field were discussed.

Committee D-11 presented 2 new methods and one specification which were approved as A.S.T.M. tentative standards as follows: Methods of Test for Abrasion Resistance of Rubber Compounds; Method of Test for Compression Set of Rubber Used for Vibration Absorption; Specifications for Insulated Wire and Cable: Class A, 30% Hevea Rubber Compound.

Concerning the first of these items the committee reported: "While no single abrasion test is entirely satisfactory, equipment for the 6 most widely used methods is commercially available. The committee recognizes that all 6 methods provide valuable technical information under certain conditions; also that the procedure for conducting a test on each of the 6 available machines should be standardized even though it is not desirable to single out a particular machine for recommendation. Accordingly, a proposed composite method has been prepared in which standardization is carried so far as is practicable at the present time."

Abstracts

Following are abstracts of papers on new developments in rubber test methods.

Testing Rubber and Rubber-like Materials for Oil Resistance. The serviceable life of rubber and rubber-like compositions in contact with oils and solvents can be accurately forecast only if laboratory tests are conducted under conditions comparable to those that will be encountered in service.

It is shown that changes in weight and volume during immersion in oils are less important than changes in such physical properties as resilience, strength, toughness, etc.

At present the oil resistance of rubber and rubber-like materials cannot be adequately evaluated from tests that are expressed numerically. The most significant changes that occur during immersion in oils take place in such physical properties of the compound as flexibility, toughness, surface disintegration, and the like. As yet these changes are evaluated by superficial examination rather than by mechanical tests. It is most unfortunate that this is true because these are the really important properties that determine the suitability of any given composition for use under any specified conditions of service. O. M. Hayden.

Rubber Compounds Used in Structural Engineering Models. A rubber litharge compound seems the most satisfactory of present materials for this use. The author suggests that (1) fillers which during the curing enter in a definite chemical combination with the rubber are preferred; (2) since the Poisson's ratio of rubber is very close to 0.5, a compound of a low Poisson's ratio in all probability will contain fillers in large volumetrical proportions; (3) the main difficulty to be overcome lies in the discovery of a filler or fillers which will permit heavy loading of the compound without impairing its elastic qualities and without introducing pronounced plastic properties. A. V. Karpov.

The Testing of Raw Materials for Rubber Compounds. The critical points to consider in evaluating a raw material for rubber are: (1) ease of incorporation into rubber batches; (2) effect on rate of vulcanization and aging; (3) ability to reenforce or soften rubber compounds; (4) effect in imparting special physical properties; (5) properties involving human factors—color, odor, toxicity, consistency. Taylor evaluated thoroughly the physical and chemical properties of zinc oxide and carbon black. He also described a number of important impurities, explaining why they are undesirable. B. S. Taylor.

Proposed Method for Testing the Adhesion of Rubber to Metal. The method consists in applying a pull at right angles to the adhered surfaces sufficient to cause separation of a cylinder of rubber from metal parts having 2 square inches area. Results are expressed in pounds per square inch. The rubber to be tested is vulcanized in cylindrical form adhering at each end to the steel adhesion test pieces. The thickness of the rubber test piece is ½-inch. Adhesion tests are made 24 hours after vulcanization. A. N. Flower and H. E. Wening.

Micronex Beads

Micronex Beads is the new name by which Dustless Micronex will henceforth be known. This material is a standard rubber black of the best grade, free from grit, controlled for rate of cure, plasticity in uncured stock, and made with special regard to dispersion. The spherical form of Micronex Beads is designed for use in connection with bulk handling and for factory layouts where dusting constitutes a serious problem. The material is a fast curing black capable of meeting specifications which require fast black and at the same time offers the advantages of the soft grade of channel black produced for high tread loadings and for mechanical goods where smooth extrusion is essential.

The pelleting process employed is carefully regulated to avoid production of hard pellets which will not disperse so thoroughly as ordinary heavy compressed black.

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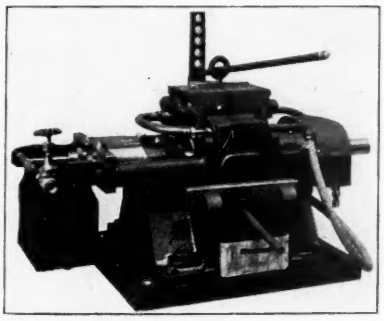
New Machines and Appliances

New Laboratory Banbury

THE need of a laboratory mixer with a capacity greater than the Midget and smaller than the No. 00, both of which are at present used extensively in laboratory work, is met by the "B" size, here illustrated. It has a capacity of 1½ pounds of crude rubber and correspondingly greater capacity for stocks of higher specific gravity. The machine is useful for experimental mixing of small batches of rubber, asphaltic materials, phenolic condensation products, resinous compounds, paints, enamels, lacquers, and other plastic materials. Designed on the same principle as the commercial Banburys, size "B" will produce mixes on an experimental scale comparable to those obtained in the larger production sizes.

The machine without motor and gear unit weighs 850 pounds and is designed to be mounted on a bench or table. It is driven by a 7½ h. p. gear-motor, connected by a flexible coupling. The approximate overall dimensions, including the motor, are 5 feet 7 inches long, 2 feet 8 inches wide, and 2 feet 3 inches high.

Both rotors as well as the sides of the mixing chamber are provided with passages for the circulation of steam, water, or other temperature controlling fluid. Batch ingredients are charged into an opening in the top of the machine, provided with a floating weight to keep the stock within the sphere of mixing action. Both sides of the mixing chamber can be opened for discharge of the mixed batch and for cleaning. Sheeting the stock after mixing is accomplished by a pair of rolls mounted on extensions of the rotor shafts. The connecting gears, machine cut with spur teeth, are entirely enclosed in a sheet metal guard, the lower half of which serves as a pan to hold the lubricant into which the gear teeth dip. Farrel-Birmingham Co., Inc., Ansonia, Conn.



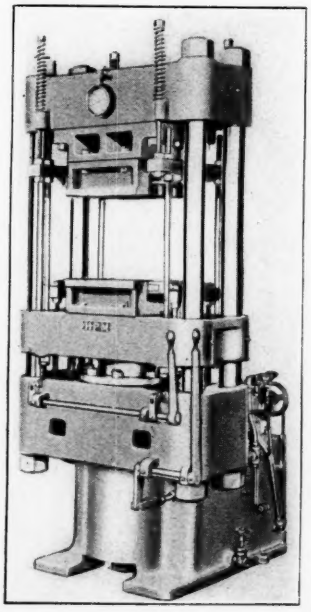
Laboratory Banbury Mixer

Plastic Molding Press

A NEW line of molding presses has recently been developed with individual electric motor drive through the patented dual-speed hydro-power transmission. Each press is compactly self-contained, with press cylinder and control valve equipment enclosed within a pedestal which also holds the supply of operating oil.

The feature of most vital importance to the molder is the unusually complete system of controls, which not only provide adjustable automatic pressure control, but also regulation of speed of ram movements and a new control principle whereby the rate of pressure increase is automatically governed according to predetermined adjustment. The latter principle introduces a new concept in the application of pressures to the molding art, superseding the "stair-step" method of changing pressures. The press is arranged for rapid closing of the molds. However the speed of both closing and opening ram movements is controlled independently of the rate of pressure application mentioned above.

The illustration shows the molding press fitted with bolsters and power ejectors to operate semi-automatic, multiple-cavity chambered molds with knockouts. It is complete and ready to operate, as shown, with hydro-power unit compactly mounted at the rear. This type is available in 6 standard sizes ranging from 50 to 300 tons pressure capacity. The Hydraulic Press Mfg. Co., Mt. Gilead, O.

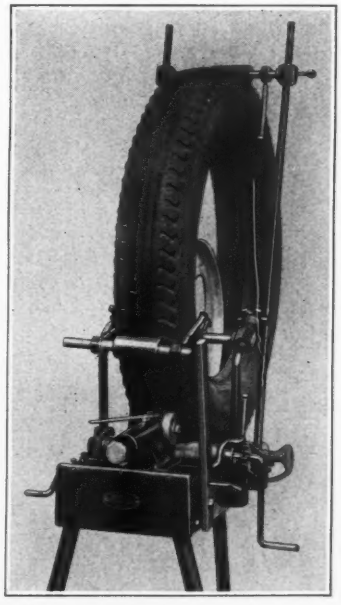


H-P-M Hydro-Power Molding Press

Tire Groover

THE bench-type tire groover pictured is a new, scientifically designed machine for putting new circumferential grooves in tires on which the original tread has worn smooth. This machine comes in 2 types: one for use on the floor to groove the tires without removal from the car, and the other a bench form shown in the illustration.

In this form a tire mounted on a rim for support is held in place on the machine by holding down rods that press it firmly against the driving rolls on which it rests. When a tire is thus set for grooving, a lever-locked sliding sleeve carrying depth-controlling rollers is released, allowing the rollers to press firmly against the tire tread. Lateral adjustment to desired point for grooving is made by a small hand-crank at the left in the picture. The grooving knife is set to the desired depth by an adjusting screw in the opposite end of the tool holder from the knife. The tire is turned for grooving by the hand-crank shown at the lower right of the picture. The wheel within the tire furnishes a positive drive for the tire and also supports it against the cut of the knife. George Associates, Inc., 79 Beacon St., Worcester, Mass.

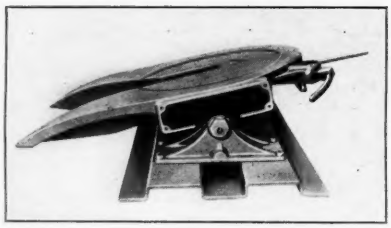


Scruby Tire Groover

Rubber Cushioned Coupler

A MANUAL floating coupler and fifth wheel for trucks eliminates all metallic contact between semi-trailer and tractor-truck by carrying the entire load upon rubber. As shown in the illustration, it cushions all side and end thrusts and is mounted on the lower fifth wheel in place of the old-style draft springs. The rubber is molded around a steel core and placed in a metal casing integral with the fifth wheel itself. A metal plate, not shown in the illustration, encases the rubber and protects it from the weather in all its phases.

The action of this manual fifth wheel in coupling and uncoupling is almost entirely automatic. Thus when uncoupling, it is only necessary to pull a conveniently placed lever which releases the hook from the king pin. In coupling, the driver merely backs under the trailer in the usual way, and the hook is automatically snapped into place, where it is securely locked. Fruehauf Trailer Co., Inc., Detroit, Mich.



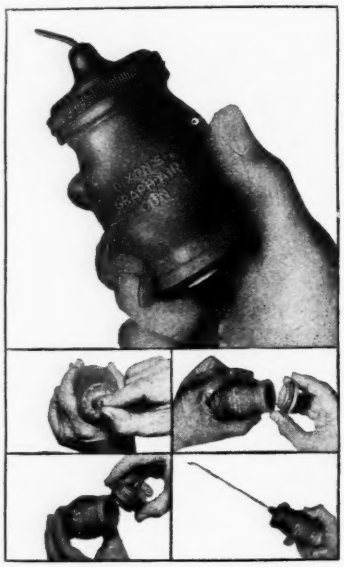
Smith Bros.

Fruehauf Trailer Coupler

Rubber Mill Drive

THE synchronous motor merits first consideration as a drive for a group of rubber mill rolls for many practical reasons. It maintains a relatively high efficiency over a wide variation of load such as encountered in the mixing and breaking down of rubber. It can be readily wound for the speed of the lineshaft which is normally around 100 r.p.m., thereby making it possible to eliminate the intermediate reduction gear which would otherwise be necessary. However, since modern reduction gear units are highly efficient and satisfactory from an operating standpoint, the choice between a low-speed synchronous motor and a high-speed synchronous motor with gear unit is largely one of comparative first cost and space requirements for installing the unit.

Dynamic braking of synchronous motors for quick emergency stops has been found so effective and satisfactory that this method is now used almost entirely, to the exclusion of mechanical or magnetic braking devices. Rapid strides have been made in reducing the roll travel on mills using the dynamic braking system. The accompanying illustration shows a 1,000 h.p., 514 r.p.m. synchronous motor on an 84-inch mill line which stops in 3½ motor revolutions upon the application of dynamic braking, the corresponding roll travel being about 12 inches. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



Dixon's Graph-Air Gun

Graphite Gun

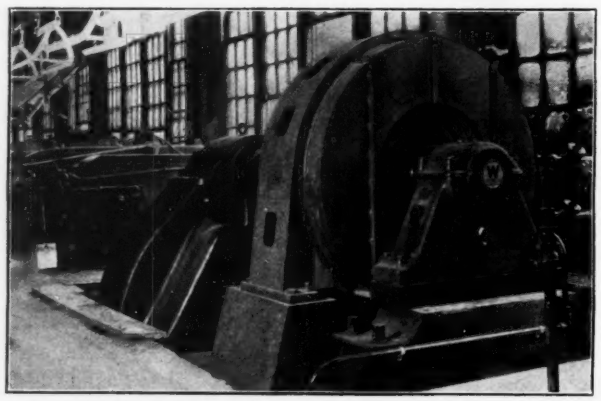
A NOVEL lubricating device using fine, graphite powder and recommended for all-purpose lubricating is shown in the accompanying illustration. The graph-air gun, being made of rubber, when squeezed deposits the graphite where needed in measured amounts through positively controlled air-pressure. The measured or graphite volume is largely controlled by the position of the nozzle in relation to the dial on top of the gun. The nozzle may be turned to a complete shut-off position making it practical to carry in tool kits without danger of spilling the graphite.

Microfyne graphite used by itself, provides oilless, greaseless, temperature-proof, combustion-proof, dripless, odorless lubrication on metal, wood, rubber, leather, paper, fiber, composition, varnish, lacquered or painted surfaces. Joseph Dixon Crucible Co., Jersey City, N. J.

Fire Extinguisher

THE new "machine-gun" hand-operated extinguisher illustrated has the pump on the outside of the cylindrical container where it cannot gum up, jam, or corrode. The pump never comes in contact with the liquid, it only compresses air which forces the liquid out under high pressure. The pump and nozzle fold down alongside the extinguisher when not in use. In action the pump is raised quickly, which instantaneously opens the positive sealing valves. The valves close automatically when the pump is lowered, shutting off the stream and saving the remaining liquid. The liquid will not leak or evaporate, for it is hermetically sealed when it is not in use. Wil-X Mfg. Corp., 29 Ryerson St., Brooklyn, N. Y.

THE CLIMCO PROCESS INSURES Complete saturation of the strands comprising the liner fabric and thereby prevents rubber spots from getting a foothold on Climco processed liners. The Cleveland Liner & Mfg. Co., Cleveland, O.



Westinghouse Synchronous Motor Mill Drive

Wilbur Fire Extinguisher

New Goods and Specialties

Rubber Ball for Dogs

AFTER long months of experimenting The Barr Rubber Products Co., Sandusky, O., has developed a compound rubber said to be tougher and more resilient than any sponge compound now made and ideal for a dog's playball. These tests have proved that a dog cannot destroy this ball as he can an ordinary sponge ball. Canine molars can chew the Indestructible Dog Playball, but will not tear it. Besides the compound of which it is made contains no poisonous ingredients. The ball also features a lightweight central core.

It is a real high bouncer. Then, too, the ball floats in water, another advantage, as so many dog lovers enjoy throwing a ball into the water and having it retrieved.

Also offered for dogs is a rubber bone of similar construction.

Hot Water Bottle with Sponge Rubber Back

FOR even greater comfort and convenience now appears a hot water bottle with a soft, smooth sponge rubber cover of unusually attractive design securely and permanently attached to the back only of the bottle. Thus the cover is always in place, ready for instant use. The front of the bottle is uncovered.

This new "Kumfy" water bottle gives the user a choice of temperature. The bottle may be filled with water hotter than usual, but not over 180° F., hotter than would be comfortable with an uncovered bottle. When the bottle is

first filled, its covered side is used, which will be found very comfortable. Then, after the water cools, the bottle is turned over on the side which is uncovered.

Covered-One-Side bottles come in 3 colors: red, blue, and green. The Faultless Rubber Co., Ashland, O.

Gas Masks and Rubber

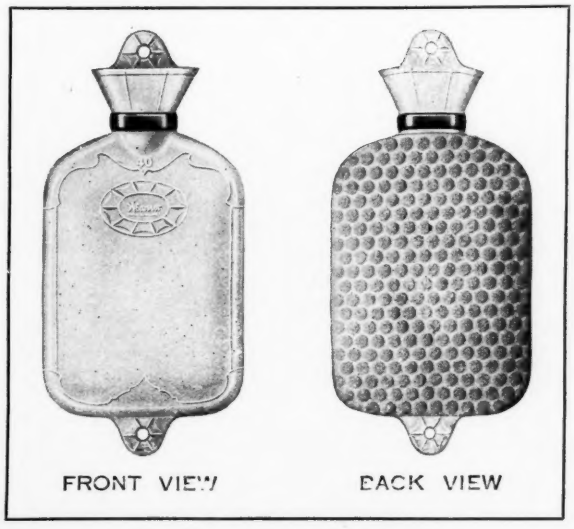
GAS masks are essential in many industries, and rubber plays no small part in their construction. In the Davis gas mask the special compound of red rubber used in the face piece and other molded parts has the important characteristics of long life under severe conditions of use, high abrasive qualities, and resistance to the action of gasoline and other vapors. The elongation feature of the rubber compound also insures comfort by the easy pull on the head. The manufacturer, incidentally, claims credit for being the first to offer the molded head harness in gas masks.

The offset section at the edge of the mask insures tightness with minimum tension on the head straps, making for greater comfort to the wearer. With smooth rubber outside and the nonslipping finish inside, the stockinette reenforcement, essential to holding the shape of the face piece, is not exposed. The streamline design of the latter eliminates projections that catch when the wearer is passing through narrow openings.

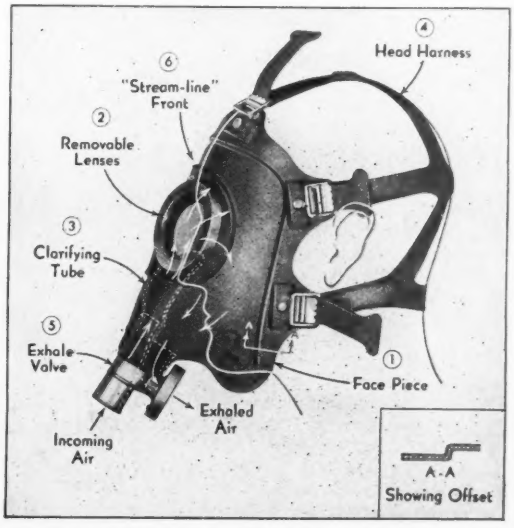
Other advantages likewise are attributed to this mask. The clarifying tubes are cemented to the face piece, insuring a definite relation to the nonshatterable, removable, and readily replaced lenses so that maximum clarifying effect is secured. The exhale valve at the bottom of the mask permits free downward motion, for there is no projecting guard to hit the wearer's chest. Furthermore the bottom strap is low on the neck so that it is difficult to pull the mask off the chin should the former catch on anything. Then, too, the buckles are adjustable. Davis Emergency Equipment Co., Inc., 55 Van Dam St., New York, N. Y.

Cavity Filler and Paint for Trees

EXPERIMENTS by the Goodyear Tire & Rubber Co. and the Akron, O., parks department resulted in the perfection of a plastic rubber tree cavity filler that readily adheres to the cavities or scars of damaged trees and prolongs their lives indefinitely. Supplementing the cement is a new tree paint for minor cuts and scars that may be used to cover cuts resulting from pruning and trimming.



"Kumfy" Covered-One-Side Bottle



Outstanding Features of Davis Gas Mask

Rubber Industry in America

OHIO

General's Strike Over

The General Tire & Rubber Co., Akron, again is in full production as the result of successful direct negotiations between President W. O'Neil and some of the workers who walked out from their jobs several weeks ago. These workers at a mass meeting voted to accept a proposal submitted to them by the company and approved by a negotiating committee of the employes. The same proposal, submitted to all labor groups among the employes, has been accepted by them. The proposal included mutually satisfactory provisions regarding wages, against discrimination because of employes' membership in any group or organization, concerning employe representation on labor problems, elimination of any management representatives on employe labor groups, and preference for older employes in service, skill, and capability considered, in layoffs and rehiring.

The company proposed to meet with any group of its employes, discuss any grievance they might have, and give prompt definite answers. During negotiations it was revealed that average yearly wages at General Tire are and have been the highest in the rubber industry and among the highest in any industry in the country. Within 12 hours after the company's proposal had been accepted, the factory was again running full blast and more than 1,400 factory workers, as well as 500 office workers not affected by the walkout, had returned to their work.

General's Toronto, Ont., Canada, plant now handles all export business formerly conducted at Akron, and Joseph A. Andreoli, vice president of the export division, has left Ohio for the Canadian division. Mr. Andreoli declared that work at the Canadian plant had been speeded up and plans were in progress for triple production at the company's factory in Mexico City, Mexico.

The Kemitex Products Co., Wadsworth, manufactures shades, window shade cloth, and liners for the rubber industry. Company branches are at 2035 S. Michigan Ave., Chicago, Ill., and 60 Federal St., San Francisco, Calif. Officers are: president, L. J. Gibbons; vice president, C. E. Jones; secretary, E. Boden; treasurer, H. E. Thomas; purchasing agent, M. A. Berryman; and chemist, R. Senseney.

R. R. Olin Laboratories on July 2 moved its laboratory and office with enlarged facilities to the Hower Bldg., 31 W. Market St., Akron.

A. C. S. Notes

The eighty-eighth meeting of the American Chemical Society will be held in Cleveland, September 10 to 14, 1934. While a few excursions will be available to Cleveland plants on September 14, a general migration to the Rubber City, Akron, is planned, with luncheon by the Akron Section, which will act as host for the day. There will be opportunity to view the great rubber factories and other Akron industries and to visit the famous hangar where 2 great dirigibles have been constructed.

H. L. Trumbull, manager of chemical research at The B. F. Goodrich Co., was elected chairman of the Akron Section at its recent annual meeting. He succeeds George Hinshaw, of the Goodyear Tire & Rubber Co. Charles R. Park, of The Firestone Tire & Rubber Co., was elected secretary; M. J. DeFrance, of Goodyear, treasurer; and A. W. Carpenter, of Goodrich, counselor.

American Zinc Sales Co., of which A. C. Eide is sales engineer, has announced that John H. Calbeck, formerly director of research for the Eagle-Picher Lead Co., has moved his laboratories to Columbus, where he has become associated with American Zinc Sales. Mr. Calbeck will conduct special research on pigment development.

The Greenville Rubber Co., 126 E. Third St., Greenville, manufacturer of tire and tube repair materials, lists the following executives: C. F. York, president, treasurer, and purchasing agent; James Birt, vice president; and L. H. Robinson, secretary.

Pharis First-Line Roadgripper

Goodrich Activities

President James D. Tew has announced several executive promotions in The B. F. Goodrich Co., Akron.

F. E. Titus, with Goodrich since 1907, was elected vice president of the company in charge of tire sales for its 4 Pacific Coast districts. He has been in California since 1928 as general sales manager of Pacific Goodrich Rubber Co., Los Angeles, Calif., which position he retains.

J. C. Herbert, assistant counsel for Goodrich, was elected vice president and general manager of Pacific Goodrich, where he had served as secretary 1928-1931. He joined the Goodrich legal department in 1927.

G. W. Hubbell was elected assistant secretary and assistant treasurer of Pacific Goodrich. He has been with Goodrich in treasury and accounting departments since 1911.

Goodrich has taken over the entire domestic rubber heel business of the United Shoe Machinery Corp., 140 Federal St., Boston, Mass., and will handle all sales direct to purchasers. The rubber concern formerly produced the rubber heels merchandised by USMC under the trade names of D and Keyscroll Heels. Goodrich also announced a new rubber heel, the Vogue wood-base heel.

Annual Play Day of the Goodrich company, believed the largest industrial picnic staged annually in the United States, again will be held at Euclid Beach Park, Cleveland, on August 13. Dave Straiton, Goodrich recreation director, is general chairman of the outing committee. Over 40,000 will attend.

A. W. Carpenter, manager of Goodrich's testing laboratories, was re-elected secretary of the committee on rubber of the American Society for Testing Materials at its recent annual convention.

J. A. Hoban, general manager of Goodrich Silvertown, Inc., Goodrich's retail division, has named 2 new managers of company stores: Ralph F. Roussey, Racine, Wis.; W. R. Scott, Vernon and Gratiot Aves., Detroit, Mich.

New Silvertown stores have been opened: 515 University Ave., Madison, Wis., W. K. Clarke, manager; 60-62 Jefferson Ave., Washington, Pa., H. F. Miller, manager; Colorado Springs, Colo., Jack DeBoer, manager, R. L. Brown, operating and credit manager, and Carl Robinson, service manager.

"GROWTH IS NEVER BY CHOICE; IT IS the result of forces working together." *Cleveland Liner Blue Blotter.*

Master Tire & Rubber Co., Akron, in an economy move transferred offices of its tire division to the plant of one of its units, Falls Rubber Co., Cuyahoga Falls, when 10 persons were sent from Findlay, former headquarters. The Cooper Tire & Rubber Co., Findlay, another unit, will continue operations, according to R. P. Bremer, Master president, employing 300 of the 400 factory workers, but dropping 60 office employes. The Falls manufacturing unit has been closed about 7 months, and F. C. Millhoff, Master vice president and director of sales, states it may reopen later this year. He also declared that operations at the Quaker City Rubber Co. unit, Philadelphia, Pa., where mechanical rubber goods, featuring hose and belts, are made, have been on a continuously profitable basis.

Ohio Rubber Co., Willoughby, through President Franklin G. Smith has announced the appointment as plant superintendent of Raymond A. Mertz, formerly with the Firestone Tire & Rubber Co., Akron. Vice President and Factory Manager Herman M. Koelliker and Production Manager James C. Barbour have resigned from the Ohio company to join the Canadian Mechanical Rubber Corp., Orillia, Ont., Canada.

The Aetna Rubber Co., through President S. T. Campbell, reported present factory operations are being carried on at both the Cleveland and the Ashtabula plants. On August 1 offices of the company were reopened in Cleveland, where headquarters for all executive and sales activities and purchasing for both plants will be concentrated. Aetna has enjoyed a very active spring and summer season on its entire glove line and refrigeration parts both for domestic and export trade. Although the hard rubber molded business has dropped off considerably, fall activities are expected to start within the next 30 days at a satisfactory rate.

Skinner Tire & Rubber Co., Dayton, on July 6 had awarded in its favor the decision in a suit involving payment of taxes based on the amount of rubber used in making retreaded tires. The government has a tax of 2.5¢ per pound on all such rubber. Selling for ⅓ as much as new tires, retreaded tires are from 6 to 10 pounds heavier. The decision exempts retreaders from paying this rubber tax.

The Independent Rubber Co., Akron, has leased the plant and equipment of the late Floral City Rubber Co., Fostoria, where Independent soon will start manufacturing rubber gloves and balloons.

Toledo Rubber Products Corp., Middlefield, lists as its product Ezy-Rug, a floor mat made by a patented process. Smith M. Johnson is company president; Earl W. Coble, vice president in charge of production; W. F. Miller, secretary; and L. M. Silverthorne, treasurer. General distributer of the rug is the American Mat Corp., Toledo.

Howard I. Cramer

Teaches Rubber Chemistry

Howard Irving Cramer, assistant professor teaching rubber chemistry at the University of Akron, Akron, O., has had practical experience as well as academic training that well qualifies him for his post. A native Akronite, having been born there September 21, 1904, he attended Western Reserve Academy, Hudson, O., and Akron U., graduating in 1926 with a B.S. in chemistry, having taken the course in rubber chemistry under Prof. H. E. Simmons. His master's degree he won at the University of Wisconsin in 1928 and a Ph.D. in organic chemistry in 1929. His doctor's thesis treated of catalytic high pressure synthesis.

Dr. Cramer toiled at the Goodyear Tire & Rubber Co., Akron, in its research laboratory from October, 1929, to September, 1933, when he was appointed to the staff of the Department of Chemistry of his Alma Mater. While at Goodyear his research was on the synthesis of rubber accelerators and antioxidants, more specifically on the synthesis of raw materials to be used in the derivation of accelerators and antioxidants by the catalytic high pressure method.

Dr. Cramer belongs to the American Chemical Society, Sigma Xi, Alpha Chi Sigma, Phi Lambda Upsilon, and Akron Torch Club.

His address is 2105 15th St., Cuyahoga Falls, O.

Rubber in Putty

"Plastikon" putty, a compound similar to ordinary painter's putty, except that it is combined with rubber, is now being marketed by The B. F. Goodrich Rubber Co., Akron, O.

This putty requires no mixing since it contains practically no oil. It effectively resists corrosive chemicals and fumes and, because of its rubber content, offers very high resistance to moisture. Another property, peculiar to this product, is its high degree of adherence to steel surfaces.

NEW JERSEY

Some New Jersey rubber manufacturers increased prices of certain goods, including a few hard rubber products. Tire production has declined somewhat. The canning season has resulted in jobbers calling for rubber tops, and the sale has been large this year.

Thermoid Co., Trenton, contemplates erecting some small additions to take care of increased business. The company continues to operate normally. Vice Chancellor Charles M. Egan has denied an application of Paul Salzman, of North Bergen, N. J., for appointment of a receiver for the Thermoid Co.

The Pocono Co., Trenton, reports continued good business.

Mercer Rubber Co., Hamilton Square, announced a 10% increase in prices of its goods. The company is fairly busy.

Lawrence H. Oakley, of the Essex Rubber Co., Trenton, was on a business trip to Boston, Mass.

Puritan Rubber Co., Trenton, continues busy filling orders for rubber tiling.

Whitehead Bros. Rubber Co., Trenton, finds business holding up well during the summer.

Jos. Stokes Rubber Co., Trenton, recently raised prices of hard rubber containers and covers. No other price change is expected.

Murray Rubber Co., Trenton, is experiencing quiet business.

Acme Rubber Mfg. Co., Trenton, stated business dropped off a little.

Hamilton Rubber Mfg. Co., Trenton, has started a factory addition, 22 by 45 feet, to cost $2,000.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, and Mrs. Bedford, sailed for England for a month. Bruce Bedford, Jr., sailed from San Francisco for the Hawaiian Islands, where he will spend the summer.

The Burnet Rubber Co., 25 Hoyt St., Newark, leased for a long term of years a 3-story brick building on Central Ave. and a one-story brick building on Bleeker St. The total additional area of 10,500 square feet adjoins the concern's plant and will be used for storing and retreading tires.

Standard Products Co., said to manufacture 80% of the channel rubbers used in the automotive and airplane industries, moved half of its Cleveland plant to Marine City, Mich., and half to Port Clinton, O., where it will occupy the former site of the Wildman Rubber Co.

Great Lakes Rubber Co., Independence Rd. and Jefferson Ave., S.E., Cleveland, manufacturer of numerous rubber goods including battery boxes, recently leased the entire first floor of the White Sewing Machine group of buildings off Main Ave., Cleveland, where the rubber concern will move as soon as alterations are finished.

NEW ENGLAND

The Fifteenth Annual Boston Shoe Fair, at the Hotel Statler and the Copley Plaza Hotel, both in Boston, Mass., July 9, 10, and 11, one of the largest and most enthusiastic ever held, attracted approximately 450 exhibitors, including an exceptionally large number of rubber concerns such as: Avon Sole Co., Avon, Mass.; Cambridge Rubber Co., Cambridge, Mass.; Converse Rubber Co., Malden, Mass.; Essex Rubber Co., Trenton, N. J.; Hood Rubber Products Co., Watertown, Mass.; The O'Sullivan Rubber Co., Inc., New York, N. Y.; Panther-Panco Rubber Co., Chelsea, Mass.; Plymouth Rubber Co., Canton, Mass.; Stedfast Rubber Co., Mattapan, Mass.; United States Rubber Co., Naugatuck, Conn. Orders were particularly heavy, with the rubber firms sharing in this lively upturn of trade. As a result, many factories will be assured of months of full-time work in the immediate future.

An interesting sidelight on this Fair is the controversy between the organization sponsoring it and the Code Authority of the industry. It seems that Section 6 of Article 8 in the industry's code gives the National Group the only authority to sponsor any trade shows or fairs in the industry. Sponsors of the Boston Shoe Fair believe this discriminating and building up a monopoly against them. A petition sent to General Johnson in protest had the signatures of over 100 manufacturers, the support of kindred organizations, local NRA officials, and various New England state and city officials.

Mechanical Rubber Workers' Union, Boston, Mass., recently issued a demand on Mayor Mansfield of that city that the contract for fire hose, awarded Fabric Fire Hose Co., Sandy Hook, Conn., amounting to $9,300, be canceled. The union pointed out that the city's refusal to award the contract to the Boston Woven Hose & Rubber Co., Cambridge, Mass., which made the same bid, necessitated laying off 40 men immediately with the possibility that 200 more Boston men soon would be let go.

Independent Auto Equipment, Inc., Providence, R. I., had appointed to it as receiver Arthur H. Feiner on the petition of Kelly-Springfield Tire Co., 395 Lexington Ave., New York, N. Y., a creditor for $4,761.52, bond being fixed at $5,000. The court restrained a sale of Independent assets under an execution obtained by the Hope Rubber Co., Inc., Providence.

Providence Insular Wire Co., Pawtucket, R. I., recently received an order amounting to $15,270 from the United States Government for lighting and power cable for navy yards in New England, Long Island, the South, and on the West Coast.

MIDWEST

A. A. Burnett

Marathon President

A varied, successful business and military career has been the lot of Arthur Andre Burnett, president and general manager of Marathon Rubber Products, Inc., Wausau, Wis., manufacturer of wearing apparel. He first saw the light of day on September 11, 1889, in Manchester, England. He attended the Pendleton Grammar School and the School of Technology, both in his native city. He is an associate of the Manchester School of Technology. There he also did post-graduate research work with Dr. A. Liebmann. In 1910 Mr. Burnett passed the honors examination of the London City & Guilds in dyeing and bleaching, and oil, fats, and waxes.

That same year he became assistant chemist for I. Frankenburg & Sons, Manchester. From 1911 to 1913 he was chief chemist at the Premier Waterproof & Rubber Co., also in Manchester. He came to America, however, in 1913, signing as manager of the Kinzie Rubber Co., Chicago, Ill.

Then the World War erupted. The patriotic young Britisher rushed home, joined the ranks, and during all hostilities served in France as an infantry officer. Later he was appointed a staff officer with the Tanks Corps and to Infantry Division Headquarters. Twice was he mentioned in dispatches.

When he was returned to mufti, Mr. Burnett once more sailed for the States. He was factory manager at the Chicago Rubber Clothing Co., Racine, Wis., from 1920 to 1922. He joined the Marathon company next, in 1923, as general manager, which position he has held ever since. He was elected secretary-treasurer of the company in 1925 and president in 1930.

Mr. Burnett is also chief executive of the Chippewa Glove & Woolen Factories, Inc., Chippewa Falls, Wis., and a member of the Society of Chemical Industry.

He may be reached at 817 Hamilton St., Wausau, Wis.

Hodgman Rubber Co., Framingham, Mass., in its Sporting Specialties Division, according to the manager, C. W. Howlett, is enjoying the greatest volume sales in its history. Plans are already under way for the development of Hodgman's 1935 line.

Manton-Gaulin Mfg. Co., Inc., on August 1 moved from St. Johnsbury, Vt., to Charlton St., Everett, Mass. The new location, more advantageously situated, was necessitated by constantly increasing business.

United States Rubber Co., wire division, Bristol, R. I., will not close for the usual 2 weeks this summer, but will operate during that period with a curtailed schedule and a skeleton crew, filling orders.

The Davol Rubber Co., Providence, R. I., has made Ernest I. Kilcup, secretary and acting treasurer, general manager, succeeding the late P. Raymond Wesley. Walter Davol, assistant sales manager, has been named assistant managing executive. His successor to the sales post is Herbert Behre. Purchasing Agent Ralph D. Berry becomes assistant secretary.

Presstite Engineering Co., 4067 Park Ave., St. Louis, Mo., manufactures asphalt specialties as roof, sewer pipe jointing, parquetry floor, and highway expansion joint cements, cork board mastic, and powdered asphalt. Company executives include W. C. Ferguson, president; T. P. Bates, vice president; George Fowler, secretary; and C. H. Smith, purchasing agent.

La Crosse Rubber Mills Co., La Crosse, Wis., on July 3 ended the strike, in progress since April 24, of 1,400 of its employes when company executives and local officials of the United Rubber Workers Federal Union signed a new agreement including a clause restraining the company from making any statements which "might be construed as detrimental to the union." The full force returned to work July 6.

The Rev. Julius Arthur Nieuwland, professor of chemistry at Notre Dame University, South Bend, Ind., who has experimented in the production of synthetic rubber, was recently granted an audience with Pope Pius. The professor gave him a pen holder made of artificial rubber which he had invented.

Brunswick Balke Collender Co., with factory at Muskegon, Mich., and principal office in Chicago, Ill., manufactures hard and soft rubber specialties as toilet seats, bowling balls, and billiard cushions. Executives include R. F. Bensinger, president; H. C. Gilbert, purchasing agent; and Walter Wollaston, in charge of the factory.

EASTERN AND SOUTHERN

The Society of Automotive Engineers' summer meeting, held at Saranac Inn, N. Y., June 17 to 22, attracted an attendance of 500 that exceeded any other summer meeting since 1929. Twenty-eight technical and administrative committee meetings, a business session, a thrilling adventure talk by Lowell Thomas, and several afternoons of outdoor and indoor sports combined with the formal engineering sessions to fill 6 days of constructive and pleasant activity.

Lee Tire & Rubber Co., according to A. A. Garthwaite, general manager, is now 51 years old, having been founded in Conshohocken, Pa., by the late J. Elwood Lee. Today the company operates 2 large factories, one at Conshohocken, another at Youngstown, O. The production of tires is centered in the former plant; while the latter specializes in a varied line of mechanical rubber products including Republic brands of power and conveyer belting, and fire, steam, air, water, and suction hose.

The Brooklyn-Manhattan Transit Co. (BMT) has been authorized by the Transit Commission of New York to operate experimentally on its rapid transit lines, 2 lightweight high-speed multi-section cars, one of stainless steel, the other of aluminum. A successful demonstration run of this stainless steel car was made last month, indicating that this type of car is destined to revolutionize rapid transit train construction. Riding comfort is assured by cushioning the car body in rubber.

Stanley H. Renton, president and general manager of the Vulcanized Rubber Co., Morrisville, Pa., has returned from a pleasure trip abroad.

First Outing of New York Group

The first outing of the New York Group, Rubber Division, American Chemical Society, was held Saturday, June 30, at Semler's Midland Park, Grant City, Staten Island, N. Y.

Fifty-eight members were present, and every one thoroughly enjoyed the varied program of sports provided for his entertainment. There were golf, swimming, soft ball, quoits and horse shoe pitching, and shuffle ball, a new game similar to shuffle board, using balls instead of wood disks. Hot dogs and cool beer were served all day. The ball game in the afternoon, between Wilder's Wildcats and Sullivan's Bears, resulted in no casualties and a score of 8 to 6 which was in favor of the Bears.

The shore dinner served at 5:30 p. m. was excellent and plentiful so that every one had more than enough to eat. "Butch" Hamister supplied the comedy and unusual entertainment by commandeering a passing hurdy-gurdy upon which he artistically rendered various selections.

During the dinner the winners of the golf tournament were announced. Prizes were golf balls: kickers handicap, C. E. Barnett, 73; low net, 18 holes, H. B. McCreary, 70; most birdies, 18 holes, W. R. Ritz, 2; most threes, 18 holes, D. A. Shirk, 4; low gross, 18 holes, E. B. Curtis, 77.

The prizes donated by rubber companies and individuals were awarded to the holders of lucky numbers drawn from a hat.

The donors and prizes follow: E. I. du Pont de Nemours & Co., copper service set, golf balls, sport bag; Essex Rubber Co., play balls; General Atlas Carbon Co., golf balls; INDIA RUBBER WORLD, croquet set, golf book, roulette wheel, rubber quoit set; Joseph A. McNulty, golf tees; Peter P. Murawski, "Applejack and Undies" in book form and in actual fact; Naugatuck Chemical Co., golf balls; New Jersey Zinc Co., electric clock; Parker Stearns Co., bathing cap, hot water bottle, magicians' bulbs, poop bag; Henry C. Pearson, shuffle ball set; Philadelphia Rubber Reclaiming Co., bill fold, steel quoit set; *The Rubber Age*, flashlight; Rubber Service Laboratories, cocktail serving tray, cocktail shaker, rubber quoit set; Seamless Rubber Co., bathing suit, hot water bottle; United Carbon Co., desk set; United States Rubber Co., bathing suit set; Van-Sul, Inc., box of rubber bands, card table covers; Vulcanized Rubber Co., hard rubber trays, pocket combs.

Thus closed the first outing of the New York Group, with every one present highly pleased over the success of this initial outing.

1. Shuffle Ball Game

2. Plenty of Beer

3. Shore Dinner

4. Some of the Prizes

5. Pitching Quoits

6. Ball Team (Wilder's Wild Cats)

7. Ball Team (Sullivan's Bears)

Rubber Code News

Code Authority

Rubber Manufacturing Industry

The National Recovery Administration on July 2 announced recognition of the following members and chairmen and their alternates of the several Divisional and Sub-Divisional code authorities of the Rubber Manufacturing Industry:

DIVISIONAL CHAPTER

MEMBERS		ALTERNATES
A. L. Viles, Chairman Rubber Mfrs. Assoc. 444 Madison Ave. New York, N. Y.		
M. I. Woythaler Hodgman Rubber Co. Framingham, Mass.	II	N. E. Bowman Pocono Co. Trenton, N. J.
O. C. Pahline Goodyear Tire & Rubber Co. Akron, O.	III	M. A. Turner Stedman Rubber Flooring Co. So. Braintree, Mass.
T. J. Needham United States Rubber Co. 1790 Broadway New York, N. Y.	IV	A. B. Newhall Hood Rubber Products Co. Watertown, Mass.
F. D. Hendrickson American Hard Rubber Co. 11 Mercer St. New York, N. Y.	V	Bruce Bedford Luzerne Rubber Co. Trenton, N. J.
R. E. Drake Avon Sole Co. Avon, Mass.	VI	H. T. Mason Quabaug Rubber Co. No. Brookfield, Mass.
J. H. Connors B. F. Goodrich Co. Akron, O.	VII	H. N. Young Hamilton Rubber Mfg. Co. Trenton, N. J.
B. B. Felix Featheredge Rubber Co. 340 W. Huron St. Chicago, Ill.	VIII	Geo. B. Dryden Dryden Rubber Co. 1014 So. Kildare Ave. Chicago, Ill.
F. T. Lane Seamless Rubber Co. New Haven, Conn.	IX	T. W. Casey Seiberling Latex Products Barberton, O.
Wm. Lichtenstein Peerless Garment Co. 231 Harrison Ave. Boston, Mass.	X	Moe Sherman Sherman Bros. Rainwear Co. 205 W. 39th St. New York, N. Y.

AUTO FABRICS, PROOFING, AND BACKING DIVISION

M. I. Woythaler, Chairman Hodgman Rubber Co. Framingham, Mass.	A. K. Dannebaum Alden Rubber Co. 1014 Wood St. Philadelphia, Pa.
J. T. Callahan Archer Rubber Co. Milford, Mass.	C. Kenyon, Jr. Vulcan Proofing Co. First Ave. & 58th St. Brooklyn, N. Y.
R. M. Freydberg Acme Backing Corp. Meadow & Bogart Sts. Brooklyn, N. Y.	F. W. Kite Windram Mfg. Co. 3 Dorchester St. So. Boston, Mass.
N. E. Bowman, Vice Chairman Pocono Co. Trenton, N. J.	J. D. Lippmann Textileather Corp. Stickney Ave. Toledo, O.
W. H. Jenks (Representing Reading) L. C. Chase & Co. 295 Fifth Ave. New York, N. Y.	N. Boynton, Jr. Boston Woven Hose & Rubber Co. Boston, Mass.

RUBBER FLOORING DIVISION

O. C. Pahline, Chairman Goodyear Tire & Rubber Co. Akron, O.	Winthrop Brown, Jr. Hood Rubber Products Co. Watertown, Mass.
W. G. Titus Hamilton Rubber Mfg. Co. Trenton, N. J.	W. I. Lewis Boston Woven Hose & Rubber Co. Cambridge, Mass.
M. A. Turner, Alternate Chairman Stedman Rubber Flooring Co. So. Braintree, Mass.	H. T. Mason Quabaug Rubber Co. No. Brookfield, Mass.

FOOTWEAR DIVISION

T. J. Needham, Chairman United States Rubber Co. 1790 Broadway New York, N. Y.	A. B. Newhall Hood Rubber Products Co. Watertown, Mass.
C. E. Speaks Firestone Footwear Co. 141 Brookline Ave. Boston, Mass.	J. F. Muffley Endicott-Johnson Corp. Endicott, N. Y.
A. H. Weschler Converse Rubber Co. Malden, Mass.	C. E. Little Servus Rubber Co. Rock Island, Ill.

HARD RUBBER DIVISION

F. D. Hendrickson, Chairman American Hard Rubber Co. New York, N. Y.	Bruce Bedford Luzerne Rubber Co. Trenton, N. J.
J. A. Smith Hood Rubber Products Co. Watertown, Mass.	O. S. Dollison Republic Rubber Co. Youngstown, O.
D. N. Hill, Vice Chairman B. F. Goodrich Co. Akron, O.	S. H. Renton Vulcanized Rubber Co. New York, N. Y.
H. T. Fowler Continental Rubber Works Erie, Pa.	M. H. Martindell Jos. Stokes Rubber Co. Trenton, N. J.
J. L. Hunter Ahlbell Battery Container Corp. Waukegan, Ill.	S. T. Campbell Aetna Rubber Co. Ashtabula, O.

HEEL AND SOLE DIVISION

R. E. Drake, Chairman Avon Sole Co. Avon, Mass.	H. T. Mason Quabaug Rubber Co. No. Brookfield, Mass.
T. Dabney Goodyear Tire & Rubber Co. Akron, O.	H. A. Derry United States Rubber Co. 1790 Broadway New York, N. Y.
Miah Marcus Panther-Panco Rubber Co. Stoughton, Mass.	M. D. Maskrey B. F. Goodrich Co. Akron, O.
R. H. Cory O'Sullivan Rubber Co. New York, N. Y.	Sol Schwaber Monarch Rubber Co., Inc. Baltimore, Md.
E. Eisen Holtite Mfg. Co. Baltimore, Md.	H. S. Maddock Essex Rubber Co., Inc. Trenton, N. J.

MECHANICAL RUBBER GOODS DIVISION

J. H. Connors, Chairman B. F. Goodrich Co. Akron, O.	W. C. Wining Goodyear Tire & Rubber Co. Akron, O.
C. D. Garretson Electric Hose & Rubber Co. Wilmington, Del.	P. H. Henkel Continental Rubber Works Erie, Pa.
H. N. Young Hamilton Rubber Mfg. Co. Trenton, N. J.	A. C. Kingston Boston Woven Hose & Rubber Co. Cambridge, Mass.

SPONGE RUBBER DIVISION

Benjamin B. Felix, Chairman Featheredge Rubber Co. Chicago, Ill.	George B. Dryden Dryden Rubber Co. Chicago, Ill.
F. M. Daly Sponge Rubber Products Co. Derby, Conn.	R. J. Limbert Lee Tire & Rubber Co. Conshohocken, Pa.
L. H. Chenoweth The B. F. Goodrich Co. Akron, O.	Geo. E. Jeandheur Elmhurst Rubber Co. Elmhurst, N. Y.

RUBBER SUNDRIES DIVISION

F. Thatcher Lane, Chairman Seamless Rubber Co. New Haven, Conn.	T. W. Casey Seiberling Latex Products Co. Akron, O.
H. B. Elmer Eberhard Faber Rubber Co. Newark, N. J.	Robert Sauter A. W. Faber, Inc. Newark, N. J.
F. J. Wilson Wilson Rubber Co. Canton, O.	H. P. Croxton Massillon Rubber Co. Massillon, O.
T. W. Casey Seiberling Latex Products Co. Akron, O.	E. I. Kilcup Davol Rubber Co. Providence, R. I.
H. A. Bauman B. F. Goodrich Co. Akron, O.	W. R. Douglas United States Rubber Co. New York, N. Y.

RAINWEAR DIVISION

New England

Fred Monosson Cosmopolitan Mfg. Co. Cambridge, Mass.	Sam Goldstein Old Colony Mfg. Co. Boston, Mass.
Wm. Lichtenstein, Chairman Peerless Garment Co. Boston, Mass.	Robert P. Cable Cable Raincoat Co. Boston, Mass.

New York

Moe Sherman, Vice Chairman Sherman Bros. Rainwear Co. New York, N. Y.	Charles Plottel Plottel Bros. New York, N. Y.
Simon Harris Harris Raincoat Co. New York, N. Y.	Davis Asch Quality Coat Co. New York, N. Y.

Midwest

A. D. Usow Badger Raincoat Co. Port Washington, Wis.	F. F. Sommers, Jr. Chicago Rubber Clothing Co. Racine, Wis.
A. B. Zuckert A. B. Zuckert Co. Milwaukee, Wis.	Max Kovitz Atlas Raincoat Mfg. Co. Chicago, Ill.

VULCANIZING DIVISION

James J. Drummey United States Rubber Co. Cambridge, Mass.	George E. Goodwin Archer Rubber Co. Milford, Mass.

Rubber Tire Manufacturing Industry Recognition of Change in Code Authority

The National Recovery Administration through Division Administrator C. E. Adams on July 6 announced recognition of the following changes in the code authority of the Rubber Tire Manufacturing Industry:

NEW MEMBERS	OLD MEMBERS
J. W. Thomas, President Firestone Tire & Rubber Co. Akron, O. (Member)	H. S. Firestone, Chairman of the Board Firestone Tire & Rubber Co. Akron, O.
E. D. Levy, President Fisk Rubber Corp. Chicopee Falls, Mass. (Alternate)	Resigned January 13, 1934 Reelected
Harry C. McCreary, President McCreary Tire & Rubber Co. Indiana, Pa. (Alternate)	J. W. Whitehead Norwalk Tire & Rubber Co. Norwalk, Conn.

With the changes indicated the following now constitute the membership of the code authority for this industry:

PRINCIPAL	ALTERNATE
Charles Borland Mohawk Rubber Co. Akron, O.	J. A. MacMillan Dayton Rubber Mfg. Co. Dayton, O.
F. B. Davis, Pres. U. S. Rubber Co. 1790 Broadway New York, N. Y.	E. D. Levy, Pres. Fisk Rubber Corp. Chicopee Falls, Mass.
Irving Eisbrouch McClaren Rubber Co. Charlotte, N. C.	Carl Pharis Pharis Tire & Rubber Co. Newark, O.
J. W. Thomas, Pres. Firestone Tire & Rubber Co. Akron, O.	James Walsh Armstrong Rubber Co. West Haven, Conn.
P. W. Litchfield Goodyear Tire & Rubber Co. Akron, O.	W. O. Rutherford Pennsylvania Rubber Co. Jeannette, Pa.
William O'Neill General Tire & Rubber Co. Akron, O.	A. A. Garthwaite Lee Tire & Rubber Co. Conshohocken, Pa.
F. A. Seiberling Seiberling Rubber Co. Akron, O.	H. C. McCreary, Pres. McCreary Tire & Rubber Co. Indiana, Pa.
J. D. Tew B. F. Goodrich Co. Akron, O.	C. C. Gates Gates Rubber Co. Denver, Colo.

New Labor Board

The application of the code authorities of the rubber manufacturing and rubber tire manufacturing industries for the establishment of a Rubber Industry Labor Board for the handling of labor disputes and labor complaints in both industries was approved July 11 by the Administrator.

The Board will consist of a permanent impartial chairman together with an equal number of employer and employe representatives. Willard E. Hotchkiss, a professor of economics and industrial management, was appointed permanent impartial chairman on July 13. The employer and employe representatives will be selected by the employers and the employes concerned in any particular complaint or dispute. They will not constitute a permanent board, but will serve as members only for the adjustment or determination of the specific matter for which they were selected.

Uniform Sale Terms

A schedule of uniform terms of sale requested by the Divisional Code Authority for the mechanical rubber goods division of the rubber manufacturing industry was approved July 12.

Pennsylvania Self-Ventilating Truck Tire

In seeking the Administrator's approval the Divisional Code Authority pointed out that the proposed schedule was intended to represent the maximum terms of sale by industry members and that the terms were essentially those which had been in effect for several years.

Government Tire Prices Fixed

An administrative order dated July 18 permits the sale of tires and tubes to the Government—Federal, State, and local—at 10% below previously set emergency floor level prices.

Stay Extended

The National Recovery Administration announced on July 23 a continuance from July 14 to August 14, 1934, of a stay in Order 156-9 which expired July 14, and said: "No member of the (automobile fabrics, proofing, and backing) Division shall coat or combine customer's auto-topping fabrics to be used in the jobbing or replacement trade, whether domestic or export, or buy or take title to any material." The further stay is to permit additional study of the problem, pending decision whether the provision in question shall be maintained.

Utica Rubber Works, 140 Liberty St., Utica, N. Y., handles rubber clothing, druggists' sundries, and mechanical rubber goods. Company officers include L. H. Wood, president; J. A. Jenkins, vice president and purchasing agent; T. D. Jenkins, secretary; and M. E. Jenkins, treasurer

(*Continued on next page*)

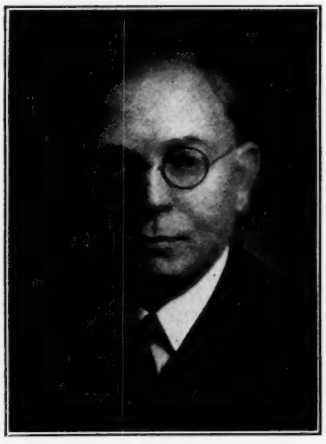
OBITUARY

Adamson Machine Official

THE Adamson Machine Co., Akron, O., lost its capable vice president and general manager on June 16 when sudden death claimed Frank H. Meyer at his home in Cuyahoga Falls. He had been appointed to the post March 1, 1934. His previous business engagements follow: chief engineer, Standard Welding Co., 1905 to 1912; vice president and sales manager, Cleveland Welding & Mfg. Co., 1912 to 1922; sales manager, The American Welding & Mfg. Co., 1922 to 1934.

Mr. Meyer, who was born in Paterson, N. J., in 1883, received his preliminary education from his father, a teacher in the Lutheran schools of Cleveland, O. Later he attended Fern College for his engineering course. He was a member of the Society of Automotive Engineers, the Akron City Club, and the Lutheran Laymen's League.

Funeral services for the deceased, who leaves a widow and a daughter, were held in Cleveland on June 20. Interment was in Knollwood Cemetery.



Frank H. Meyer

Wringer Salesman

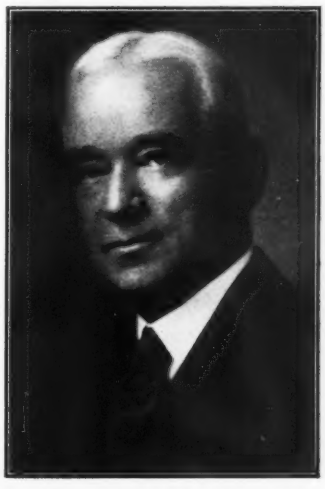
WILLIAM THEROUX, Chicago, Ill., salesman for the American Wringer Co., Woonsocket, R. I., died at the Woonsocket Hospital, June 29 of cerebral hemorrhage after a 3 days' illness while on a visit to friends. He was born at Woonsocket 46 years ago and is survived by his widow and one son.

Distinguished Chemist

ON JULY 9, William Hultz Walker, director and patent specialist of Dewey & Almy Chemical Co., Cambridge, Mass., was fatally injured in an automobile accident at Seabrook, N. H. He had been chief of the United States Chemical Service during the World War and had received a Distinguished Service Medal for his work. Mr. Walker had also been a lecturer and instructor at the Massachusetts Institute of Technology and at Harvard University. From 1894 to 1907 he had been in partnership with Arthur D. Little for the application of chemistry and physics to industry.

Mr. Walker was born in Pittsburgh, Pa., April 7, 1869. His degrees include B.S., Pennsylvania State College, 1890; Ph.D., University of Göttingen, Germany, 1893; and D.S. (honorary), University of Pittsburgh. He also belonged to American Academy of Arts & Sciences, American Society of Chemical Engineers, American Chemical Society, American Electro-Chemical Society, and American Iron & Steel Institute.

Surviving are his wife and a son.



W. H. Walker

William B. Wiegand, director of research, Binney & Smith Co., 41 E. 42nd St., New York, N. Y., has returned from an extended business tour of the leading rubber producing and manufacturing centers of the world. He sailed March 24 from Vancouver for Japan, where he visited the leading manufacturers of rubber goods, ink, and lacquer, and lectured at Kobe, Osaka, and Tokyo before the Japan Rubber Manufacturers' Association and the Ink and Lacquer Association.

At Shanghai he visited the rubber and ink plants and addressed 200 technical representatives from the rubber, ink, and paint industries of that section. Following a brief visit at Hong Kong he proceeded to Singapore and Kuala Lumpur, F. M. S., witnessing the operations of preparing plantation rubber. At Kuala Lumpur he lectured before a joint meeting of the Rubber Research Institute and the Institute of Chemists. Mr. Wiegand continued his westward journey via Ceylon, Suez, Italy, and France to England and thence to New York. At Milan he spoke before a gathering of rubber chemists and technologists and at Paris lectured to the ink, paint, and lacquer fraternity. In London he lectured twice, once on rubber and again on paint. At Birmingham he delivered one address on rubber. He found his lecture audiences greatly interested and appreciative of his message on the newest developments in the technology discussed in his various talks.

Binney & Smith Co., 41 E. 42nd St., New York, N. Y. Thirty department heads and assistants of the company tendered a luncheon on July 19 at the Uptown Club, New York, to Allan F. Kitchel and Norman L. Smith, vice presidents, on the twenty-fifth anniversary of their connection with the organization. W. B. Wiegand was toastmaster, and speeches were made by Messrs. Kitchel, Smith, and Edwin Binney, co-founder of Binney & Smith Co.

Kelly-Springfield Tire Co., 395 Lexington Ave., New York, N. Y., last month announced the resignations of President William H. Lalley and Vice President D. R. Weedon, both of whom were members of the board and of the executive committee. Vice President Edmund S. Burke, one of the 2 new directors elected to the company at the annual meeting in March, was named president.

H. Muehlstein & Co., Inc., crude rubber importer, 122 E. 42nd St., New York, N. Y., held an outing for its office force on July 14 at the Nassau Shores Country Club, Massapequa, Long Island, where facilities were provided for golf, baseball, bathing, and other sports. Fifty dollars were distributed in $5 prizes to successful contestants in their various games and races. Luncheon and dinner were served at the club house followed by dancing.

(*Continued on page* 58)

EDITOR'S BOOK TABLE

New Publications

"Private Initiative versus Planned Economy." Farrel-Birmingham Co., Inc., Ansonia, Conn. This is the 7th in a series of booklet editorials by Allen W. Rucker in collaboration with N. W. Pickering, president, Farrel-Birmingham Co., Inc. It deals with the problem of purchasing power and factors that retard recovery. The argument is convincing and is summarized in the following: "Technological progress must be permitted in order that the product of one worker's effort may be equitably exchanged for the product of another."

"A Century of Business Progress." H. Muehlstein & Co., Inc., 122 E. 42nd St., New York, N. Y. This analytic chart is a graphic record of the trend of business and wholesale commodity prices in the United States for the past century. The interpretations shown are based upon a chart of the National Purchasing Agents with acknowledgment accorded to Col. Leonard P. Ayres, of Cleveland Trust Co., and L. C. Reynolds, American Writing Paper Co., Holyoke, Mass. The chart covers the interval from 1830 to 1936 inclusive.

"Air Compressor Air Cushion Valve." Bulletin No. 104; **"Penn-Motor Pumping Units."** Bulletin No. 223; **"Multi-Stage Centrifugal Pumps."** Bulletin No. 221. All three issued by Pennsylvania Pump & Compressor Co., Easton, Pa. This group of engineering bulletins relate to pumping specialties of modern design and high efficiency. Their structural details are fully illustrated and operating data is given.

"The World Cotton Position." Chart disclosing the dominant factors for 40 years of production, carryover, consumption, and developments affecting prices, 1893-1934. Economic Associates, 91 Wall St., New York, N. Y. This is one in the "Commodity Economic Series." The charts employ a new principle which coordinates the major factors usually determining prices.

"Link-Belt Herringbone Gear Speed Reducer." Book No. 1415. Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill. This booklet contains illustrations and complete data on the construction, etc., of Link-Belt speed reducers, flexible couplings, and herringbone gears for large reductions and heavy loads.

"Shafer Roller Bearings. Catalog No. 12." Shafer Bearing Corp., 6501-99 W. Grand Ave., Chicago, Ill. This new catalog describes a complete line of roller bearing units ready to install for a wide variety of industrial and machine applications. The book is fully illustrated and well indexed for ready reference to all the many types, specifications, and data.

Book Review

"Onward from the Beginning." A historical sketch of the Royle tubing machine. By Vernon Royle, president of John Royle & Sons, Inc., Straight and Essex Sts., Paterson, N. J. Paper, 103 pages, 6 by 9 inches. Illustrated.

The author introduces his account of the origin and development of the Royle tubing machine line with some very interesting personal recollections of incidents relating to the reception of the early machines and the secrecy with which their performance was surrounded by the rubber manufacturers who used them.

The developments recorded in the text and photographic reproductions cover a half-century of progress in the design and construction of tubing machines and appliances for dealing with rubber, celluloid, etc., by the extrusion process. The latter half of the book deals with tubing heads and fixtures, insulating heads and fixtures, strainer heads, cylinders, stock screws, driving gears, thrust bearings, motor drives, take-off mechanisms, lubrication, celluloid, plastics and welding wire coating.

The book is a summary of accomplishment in well-designed tools that mean much to the rubber industry.

"Achema Jahrbuch 1931-34." Issued by the Dechema, Deutsche Gesellschaft fur Chemisches Apparate-Wesen e.V., Seelze bei Hannover and Berlin, on the occasion of the Achema VII exhibition held at Cologne May 18 to 27, 1934. This booklet contains a review of the various apparatus, machinery, and accessories used in the chemical industry, together with a discussion of the materials employed in their construction: metals, glass, porcelain, rubber. Besides appear brief illustrated reports on the progress made in the different fields. A section is devoted to the memory of great German chemists; while lists of the articles displayed and the firms represented at the exhibition conclude the informative book.

"Ausstellungsführer, Achema VII," also published by the Dechema, gives plans of the exhibition and lists of exhibitors and the chemical apparatus and machinery displayed.

"Carbon Joe's Gastex Gazette." General Atlas Carbon Co., 60 Wall St., New York, N. Y. This is a new house organ to appear monthly.

"Rubber: A Statistical Appraisal." F. R. Henderson, 25 S. William St., New York, N. Y. This discussion is offered by the author to dispel doubts and fears in the minds of those persons who regard the excessive stocks of crude rubber in the world as a disquieting factor in the present situation of that commodity.

Rubber Industry in Europe

GREAT BRITAIN

I. R. R. Committee

The second meeting of the International Rubber Regulation Committee was held June 27. It welcomed Sir George Beharrell, representing the India Rubber Manufacturers' Association of Great Britain, and Herr Otto Friedrich, representing the *Reichsverband der deutschen Kautschukindustrie,* who attended the meeting as members of tfie Advisory Panel of Manufacturers. The appointment of a third member of the Panel by the Rubber Manufacturers' Association of America is expected shortly.

The Committee considered various matters relating to the organization of its work, and the preparation of statistics of production, costs of production, consumption, and stocks of crude rubber. It also considered reports by the various delegations on the measures taken by the countries they represent to implement their obligations under the International Agreement. This matter is very well advanced, and the Committee is satisfied with the progress made. The next meeting was set for July 31.

R. G. A. Meeting

The Rubber Growers' Association held its twenty-fifth annual general meeting in London on June 7, when James Fairbairn was elected chairman for the ensuing year. The retiring chairman, W. F. Gallagher, in his speech discussed the new Rubber Regulation Scheme, which he characterized as simple, flexible, and workable, though he pointed out that the smooth working and success of the scheme depended in no small measure on producers willingly accepting the obligations it imposes on them. In answer to those who have criticized the failure to establish a pivotal price, he showed that owing to abnormal conditions in the plantation industry the costs in recent years have not been economic costs; so there is uncertainty here, and hence difficulty in adjudging an economic price level.

"No producer," he continued, "would like to see a price prevailing that is above the economic price level, as the higher the price the more easily can substitutes establish themselves. The price-level may affect consumption too, though not so much as is usually believed. Such substitutes as can in the long run hold their own at the economic price for crude rubber are economically justified, and producers must be prepared to accept them as successful competitors. Any use of rubber which can be maintained only at an uneconomic price for rubber is an uneconomic use and must ultimately disappear."

The statements regarding substitutes also apply to reclaimed rubber, and Mr. Gallagher further pointed out that rubber is going increasingly into non-abrasive uses as cushions and mattresses, and most of this rubber has not been destroyed by wear and will probably come on the market again as reclaim.

Turning to research and propaganda, he said 2 major duties were before producers: (1) to defend and maintain rubber in its present applications and prevent it being replaced by other products; (2) to increase the consumption in its present uses and to find new uses. In the endeavor to increase consumption, however, the importance of production research may be underestimated. Yet everything that lowers prime costs, either of extensions or of production, is of value and tends to strengthen rubber in competition with other commodities; and sustained research is necessary to discover the most advantageous forms of preparing and supplying rubber.

Rubber Packed in Paper

Much interest was displayed in rubber circles in a trial shipment from Malaya of smoked sheet packed in paper cases instead of the usual plywood cases. The paper containers, of 4 thicknesses of Kraft (brown) paper, came in 2 sections, the one closing over the other, an adhesive hermetically sealing the whole. One end of each half of the case has a special stitching easily ripped open when cases must be inspected or the rubber removed. Each case held 112 pounds of rubber against 224 in the plywood cases. Although the rubber was transshipped en route, the paper cases withstood the extra handling very well and arrived in London in good condition; whereas several plywood cases of rubber forming part of the same consignment were badly damaged. The paper packing not only is cheaper than plywood cases, the cost is less than half, but as they can be packed in compact bales for sending out and hence occupy very little space as compared with plywood cases, a substantial saving in freight can also be effected.

Flameproofing Rubber Tiles

The growing use of rubber in the form of tiles and as a structural material generally, gives special importance to a new impregnation process to render rubber floor coverings flameproof. A subsidiary of Imperial Chemical Industries, Ltd., has perfected so-called Seekay Wax, a non-inflammable chloronaphthalene wax, and rubber tiles impregnated with this product have been subjected to severe tests by Johnson & Phillips Ltd., electrical cable maker, which are said to have established the efficiency of the wax as a flameproofing agent. Flameproofing, it should be added, implies treatment to resist flame and prevent it from spreading. In one of the tests the processed rubber tiles were placed for a specified time in the hottest part of the flame of a Bunsen burner without the flame getting a hold on the rubber. The treatment with Seekay Wax, which is an extension of the process already successfully applied to electrical cables, will not adversely affect the color or the surface of the rubber or impair its special qualities as flexibility or tensile strength.

Goodyear Report

The Goodyear Tire & Rubber Co. (Great Britain) booked profits of £176,345 for 1933 against £121,471 for 1932, and declared a 10% dividend tax free, against 5%, also tax free. The manufacture of rubber soles and heels, started last January at Wolverhampton, has proved so successful that 2 new buildings have been erected to provide additional facilities to handle the demand.

Holland

The Eleventh Report of the Technical Department of the International Association for Rubber and Other Cultivations in the Netherlands Indies contains much useful information on the progress of rubber experiments in Holland during 1933. Asphalt emulsions and latex, it was found, can in most cases be mixed in any proportions, and after evaporation the mixtures showed improved qualities as compared with the original asphalt, as increased melting point, decreased tendency to flow, increased resistance against pressure, in resiliency, and in adhesiveness. Experimental road sections have been coated with these asphalt-latex emulsions.

Asphalt-colloidal clay emulsions are now prepared with a suspension of the colloidal clay in latex, with the addition, where necessary, of protective colloids, and products are thus obtained which do not flow even when exposed

to shearing stresses. This improvement, it is expected, will widen the use of asphalt emulsions for building purposes. Further experimentation with these mixtures is being continued.

Rubber powder prepared with dextrine will absorb moisture very readily from the atmosphere. Such powder, exposed to laboratory atmosphere, becomes a permanently coherent mass within a month and when exposed to the open air, within a still shorter time. When moisture is excluded, however, the powder form is retained so that airtight packing in tins or metal drums is essential.

Extensive investigations are being conducted with chlorinated rubber particularly with a view to obtaining a stable product for paint manufacture, and it has been established that chlorinated rubber is stable at ordinary temperatures. With increased temperature, the stability diminishes, but at first so slowly as not to impair the protective action of the chlorinated rubber paint on under surfaces. However successful use of these paints depends on expert compounding (suitable binders and plasticizers) and suitable preparation of the surface to be painted.

In tests carried out in a sugar factory in Java, Tornesit T.O.9, Tornulose roof paints H.Z. and Z.L., supplied by Pieter Schoen & Zn., Zaandam, Holland, were used on new iron roofs, the zinc being first prepared with a 1% hydrochloric solution. Later examination showed that the paints mentioned adequately protected the metal from the action of the sulphurous acid vapors around the sulphur ovens and other apparatus; whereas in other sugar factories, where the metal had not first been properly prepared, results were not good.

By fractionated precipitation with a benzol-alcohol mixture from the benzolic solution, fractions were obtained having different properties; some, for instance, show slightly more stability when heated in water at 96° C.

In tests in the Dutch Indies, building boards of latex and *bagasse* (sugar cane waste) amply withstood attacks from termites, but similar boards prepared with sisal waste were damaged.

Rubber Paving in Italy

Various experiments in paving with rubber have been undertaken in Italy during recent years, with blocks designed and produced by the Societa Italiana Pirelli. In 1933 a section of paving was laid in the Via Galilei, Milan, with Pirelli blocks, or tiles as they might more correctly be called from their flatness. They consist of a 15 mm. layer of rubber on a 20 mm. base of ebonite, giving a total thickness of only 35 mm. with a length of 300 mm. and width of 200 mm. The ebonite base has wide dovetail shaped grooves to a depth of 12 mm. for anchoring to the road bed; while the softer rubber surface has numerous narrow

Le Strade

Rubber Paving—Via Galilei, Milan, Italy

channels running alternately across width and length to give a maximum anti-skid effect.

The cost of this paving is said to be only about half as much as that of the best English paving, and with wider use a still further reduction in cost is possible.

Germany

A recently nominated auxiliary committee to assist the head of the Rubber Control Bureau includes the following: L. W. Klentze, Klentze & Co., G.m.b.H., Hamburg; General Director Brauning, Deutsche Dunlop Gummi Co., A.G., Hanau a.M.; General Director Maul, Gummiwerke Metzeler & Co., Munich; Hans Pahl, Pahlsche Gummi-und Asbest Ges. m.b.H., Dusseldorf-Rath; Director Schafer, Harburger Gummiwarenfabrik Phoenix, A.G., Harburg-Wilhelmsburg; Director Straube, Radium Gummiwerke m.b.H., Koln - Dellbruck; General Director Tischbein, Continental Gummiwerke A.G., Hannover; Oscar Traun, New York - Hamburger Gummiwaren - Co., Hamburg; and Wilhelm Vorwerk, Vorwerk & Sohn, Barmen.

The Control Bureau has ordered all wholesale dealers in bicycle tires and tubes to send in a list of stocks, classified according to brands, size, and color, and sales from goods received before June 4, 1934, are prohibited.

A further order has been issued to all manufacturers using more than 100 kilos of rubber or latex a month to register their factories with the Control Bureau immediately and to give a detailed statement of their stocks as well as of the amounts and qualities used during January-May, 1934, inclusive, their obligations regarding acceptance of supplies from foreign sources and payments due the latter.

The growing shortage of raw materials has caused the Reich to place the textile industry on a reduced schedule; while another decree puts the entire rubber industry under government control and compels the tire industry to form a cartel to prevent expansion of present production output.

The Achema VII, in Cologne, May 18 to 27, 1934, was considered a great success, and the wide display of apparatus, machines, and processes for the chemical industry drew large numbers of interested spectators.

The rubber industry was represented by several firms specializing in products for the chemical industry, as acid-proof linings, tubes, belts, stoppers, sieves, etc., and included Franz Clouth A.G., (Durabilit hard and soft rubber linings), Continental Gummiwerke A.G., New York-Hamburger Gummiwaren Co., Deutsche Tornesit-Gesellschaft m.b.H., the A.E.G., Harzer Achsenwerk (Vulcoferran), Keramchemie Berggarten G.m.b.H., (protective masses on rubber base known as Keraplast and Kerasolith).

The comprehensive exhibit demonstrating progress in the production of new metal alloys with high resistance to chemicals must have proved especially interesting, if somewhat disturbing, to rubber manufacturers suggesting as they did the possibility that these special, resistant metals might tend to eliminate the use of rubber linings.

The general director of the Continental Gummiwerke A.G., Willy Tischbein, has asked to be retired after 40 years with the company, the last 25 years of which were as a member of the board of directors. If Continental was able rapidly to regain its place among rubber manufacturers after the war, it was largely due to Herr Tischbein's activities.

Other European Notes

Encouraged by import restrictions, local manufacture of rubber goods in Bulgaria has increased considerably in recent years, and foreign goods have largely been replaced by usually inferior products made by the numerous small factories that have sprung up. In 1933 home production included about 980,000 pairs of rubber-soled footwear, 200,000 pairs of galoshes, 280,000 pairs of clogs, and 3,100 automobile tires. Imports of raw materials have increased and now include 400 tons of crude rubber a year. Among the manufacturers may be mentioned H. Bakisch, Gummiwarenfabrik, Sofia, and the Bulgarisch-Belgische A.G., Sila, Gummiwarenfabrik Tatar-Pasardjik. The latter, capitalized at 5,000,000 leva, employs about 300 persons and produces around 3,000 pairs of rubber shoes daily. For last year the firm reported a profit of 260,000 leva.

As a result of Bata competition in Poland, Polish interests are turning to Roumania, it seems. A Polish company is said to have established a factory for snow shoes and galoshes in Czernowitz; while others also are preparing to settle in Roumania.

Attention may also be called to German interest in manufacturing in Austria. Within a very short time 2 German firms started factories here, first the Julius Rompler A.G., Zeulenroda, and now Zieger & Wiegand A.G.,

(*Continued on page* 58)

Rubber Industry in Far East

NETHERLANDS EAST INDIES

Native Rubber Restriction Measures

While the measures providing respectively for an export duty on native rubber and for fixing the ratios of native to estate rubber at 71½ to 100 were defeated in the People's Council, the Government overruled the Council and, as has since become known, the measures were duly enforced. The Government explained its attitude regarding the native percentage of the quota on the ground that without the stimulus of restriction talk, prices last year would not have increased, and native rubber outputs would not have reacted as they did; furthermore the advantages of restriction are preponderating not only for rubber producers but for the general prosperity of all Netherlands Indies.

As to the export duty, this is largely a means to an end, a more suitable method of regulating native exports. Given the short time for preparation, it was necessary to take measures that could be put into effect at once, and the export duty had to be selected as affording the readiest means of bringing native exports down to the desired level. It is intended to restrict these exports gradually, considering as far and as fairly as possible the interests of the different districts. At the same time the possibility of replacing the duty by a system of individual or similar restriction in all rubber producing districts in the Outer Possessions or only in special sections is to be investigated soon. Already such an investigation is going on in Palembang, Sumatra.

In anticipation of criticism that the native is doubly penalized by the export duty, that not only is his output restricted, but he receives less for it, the Government states that the proceeds of the tax will largely be used to benefit the native population.

Certain members of the Council suggested that the export duty might not affect native outputs as calculated, for while the price after deduction of the export duty might not permit natives with higher costs to tap, the large number whose costs are lower would tap more than ever to increase their profit. It was further suggested that small factories would be set up in Java and Sumatra; the owners would buy native rubber and rework it; and it was asked how such rubber would be classed, whether as native or plantation rubber, and how it could be controlled.

In reply the Government stated that native rubber bought and remilled remains native rubber under all circumstances. No difficulty in this respect is looked for. The possibility exists, however, that factory owners might mix native rubber bought underhand with other rubber and export the product as estate rubber. But by doing so they run the risk of severe penalty besides the chance of losing their licenses.

That the fear expressed above is not unfounded is evident from a report that in Bantam, Java, many Chinese have erected small rubber factories and are buying rubber and latex from the natives. It is suspected that the owners are clandestinely exporting this rubber. These factories constitute a double menace, it is pointed out, for not only would they obstruct restriction, but encourage the stealing of latex. The matter is already being closely investigated.

Goodyear in Buitenzorg

According to the *Bat. Nwsbl.,* the Goodyear Tire & Rubber Co. is seriously considering erecting a factory in Buitenzorg, Java. It seems Goodyear originally intended to buy land for a factory in Batavia, but negotiations fell through owing to the price of the land and the high electricity rates. The land now selected, which appears to have been offered on reasonable terms, is so situated that direct connection with Batavia by rail is possible, an important consideration since in this way latex and rubber can be shipped straight from the Goodyear plantations on the East Coast of Sumatra via Tandjong Priok, Batavia's harbor.

Goodyear is said to be planning to make automobile tires and all rubber articles which it manufactures in America, the goods being intended especially for the Netherlands Indies market.

Statistics

According to the Central Bureau of Statistics, rubber exports from Java and Madura in May, 1934, came to 12,347 tons, against 6,890 tons for May, 1933; shipments from the Outer Possessions at the same time were 54,129 tons against 20,822 tons, making a total of 66,476 tons against 27,712 tons, or almost 2½ times the May, 1933, total.

Astrolith and Sunolith

Two lithopones, Astrolith and Sunolith, are of special interest to rubber compounders because of their absolute uniformity in physical and chemical characteristics, greater whitening power, fine particle size, and ease of mixing.

MALAYA

Free Ports and Restriction

Singapore go-downs and factories are bursting with rubber rushed from the Federated Malay States and Johore to avoid stock restrictions under the provisions of the new regulation scheme. In a single week about 7,000 tons were sent by rail, and nearly as much came in by road from Johore. As Singapore and Penang are free ports, exports therefrom are not controlled. But imports are strictly supervised, and no rubber can be imported for local consumption or reexport without permit. Extra vigilance is also being required of preventive officers to prevent smuggling.

Incidentally, exporters have been informed of the rise of freight rates on rubber from the Straits to New York, North Atlantic, and Gulf ports as from September 1, 1934.

Rubber Control Bill

According to the Rubber Regulation Bill for the Straits Settlements recently passed in the Legislative Council, there is to be an assessment committee in the case of holdings of over 100 acres or a district officer in the case of holdings under 100 acres, who will assess the standard production of the various rubber producing lands. Owners who have any criticism to make on the amount allotted them must do so within 2 months. The committee will consider the objections, but the decision of the committee is final so far as the standard production of an estate is concerned. But in the case of estates between 25 and 100 acres, the controller may, if he thinks there are sufficient grounds for doing so, revise the certificate of the district officer.

If an owner wishes to export himself, he can have his export credit placed to his credit in the books of the export officer, or, if he wishes merely to sell and not to export, he can have the amount credited in the books of the controller and he can sell the rubber to a purchaser and that rubber will carry with it the right of export.

Similarly importers must in the first instance be dealers and secondly must be registered under the ordinance; and no rubber is to be imported or exported, except from Singapore and Penang, without a certificate of origin. Drastic penalties are provided for any breach or attempted breach of the rules, the penalties including confiscation and destruction of the rubber concerned.

One of the unofficial members, touch-

ing on the question of the basic price, said: "One appreciates it is very difficult to fix a basic price in an international scheme which involves currencies of various countries which may fluctuate among themselves, but I understand 7d. or 8d. is suggested as a fair and equitable price. I hope that will always be kept in view and no very high price aimed at."

Labor Shortage

During the latter part of 1933 indications of a labor shortage already had appeared in certain sections of Malaya, and now with returning prosperity in tin mining and improved conditions in the rubber industry there is actually a real shortage of Chinese labor. The Chinese have not been slow to take advantage of the situation and are asking and getting much higher wages in certain parts of the country. In fact press reports state that the labor shortage is so acute in Johore that it is expected coolies may demand $2 (Straits currency) a day.

To be sure, reports of prosperity in Malaya are already attracting more Chinese labor; while at the same time it has been announced that the Government of India has agreed to permit assisted immigration to Malaya during 1934 of 20,000 South Indian laborers. However it will no doubt take time before the labor supply is again adequate, and in the interim wages will probably go up.

The labor situation is, of course, extremely important, especially at this moment, as on the one hand a real shortage of coolies would undoubtedly make it difficult for many states to fill their quotas, while on the other hand, higher wages would add to costs, thus affording a welcome weapon to the many who are dissatisfied with the price of 7d. or 8d. per pound that is apparently being aimed at. In fact, with increased wages for coolies, higher salaries for the staffs, a rise in freight rates, higher fees again for agents, etc., and higher quit rents, to mention some of the impending increases, there will be ample justification for producers demanding prices above the level usually mentioned today.

But there is another aspect to the situation. With the system largely prevailing on small native holdings, whereby owners give tappers a share of the crop instead of paying a fixed wage, the native owner will have little or no difficulty in obtaining the necessary labor, especially if estates do not raise wages rapidly or high enough.

Sir Cecil on Restriction

Sir Cecil Clementi, it should be noted, while on leave in England, discussed restriction of rubber at a meeting of the British Malaya Association. He has always been opposed to restriction and spoke as follows: "The last rubber restriction scheme broke down because it was unilateral—only British restricted. The present rubber restriction scheme may, I fear, also prove to be unilateral, in a different sense; namely, that only plantations will genuinely restrict their output, while native-grown rubber may even increase in tonnage. Native rubber is the crux of the situation; and it behooves all concerned to use their utmost endeavor to ensure that for the present there shall be no additional planting or unauthorized tapping of rubber by native growers, to whom the increased price is a very great temptation. If this danger can be obviated—it is a very big one—then I believe the new scheme has every chance of restoring prosperity to the rubber industry."

This statement has been severely criticized by W. Arthur Addinsell, chairman of Hong Kong (Selangor) Rubber, Ltd., who said that if the same remarks had been made by such a responsible person as Sir Cecil Clementi in the Netherlands East Indies, H. Colijn, the colonial secretary, would have had his own very salutary methods of dealing with the case.

Latest reports state that Sir Cecil has resigned as governor and commander-in-chief of the Straits Settlements and high commissioner for the Malay States on the grounds of ill health. Sir Thomas Shanton Whitelegge Thomas, now governor of the Gold Coast, will be his successor.

European Notes

(*Continued from page* 56)

Leipzig. The latter is said to have acquired a factory in Vienna, where after alterations dipped rubber goods will be manufactured for sale in Austria and in the Succession and Balkan States.

Michelin et Cie., France, closed its 1933 accounts with a profit of 33,354,000 francs against 33,650,018 francs the year before.

Etablissements Bognier et Burnet, Ivry-sur-Seine, reported net profits of 744,705 francs, not including the carry-forward of 510,177 francs from the year before. A dividend of 5 francs per B share was paid.

Societe d'Applications Nouvelles du Caoutchouc, Saint-Denis (Seine), with capital of 2,625,000 francs, is in liquidation.

Eastern and Southern

(*Continued from page* 54)

Paul Bertuch & Co., Inc., 80 Broad St., New York, N. Y., crude rubber broker, lists Maurice Tingley as president and S. Troy, secretary.

McCarty Aniline & Extract Co., Inc., 72 Cliff St., New York, N. Y., includes among its products Revertex compounds for the textile industry and the development of new uses of concentrated latex. Sta-Tite is the company trade name. Thomas McCarty is president and purchasing agent, and Samuel P. Tauber is secretary- treasurer.

(*Other U. S. notes on page* 72)

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	6 Mos., 1934 No.	%	6 Mos., 1933 No.	%
Low Pressure (1933)				
15x5.00E	.....	...	35,499	0.8
15x5.50E	5,171	0.1	20,218	0.5
16x3.50D	.....	...	150	0.0
16x4.00D	1,061,024	14.2	446,625	9.9
16x4.25D	425,522	5.7	.....	...
16x4.50D	412,743	5.5	62,989	1.4
16x5.00E	27	0.0	684	0.0
16x5.50E	.....	...	187	0.0
16x6.00E	.....	...	548	0.0
(1934)				
15x5.50F	756	0.0	.....	...
16x4.00E	48,788	0.6	.....	...
16x4.50E	497,670	6.6	27,210	0.6
16x5.00F	161,624	2.2	.....	...
16x5.50F	23,140	0.3	.....	...
Drop Center				
17x3.00D	553,706	7.4	450,144	10.0
17x3.25E	642,799	8.6	787,330	17.0
17x3.62F	1,604,288	21.4	945,828	21.0
17x4.00F	30,381	0.4	172,339	3.8
17x4.19F	6,052	0.1	22,382	0.5
18x2.15B	12,161	0.2	20,395	0.5
18x3.00D	12,922	0.2	466,923	10.4
18x3.25E	61,289	0.8	97,842	2.2
18x3.62F	338	0.0	1,697	0.0
18x4.00F	4,208	0.1	2,445	0.1
18x4.19F	11,738	0.2	12,155	0.3
19x2.15B	7,966	0.1	2,959	0.1
19x3.00D	28,502	0.4	16,632	0.4
19x3.25E	1,410	0.0	.....	...
21x2.75D	.....	...	484	0.0
21x3.25E	5,222	0.1	22	0.0
Flat Base Balloon				
17x4	840	0.0	659	0.0
17x5	3,901	0.0	4,913	0.1
18x3.00D	1,005	0.0	.....	...
18x3.25E	959	0.0	.....	...
18x4	3,969	0.0	1,852	0.0
18x4½	.....	...	409	0.0
18x5	1,038	0.0	5,474	0.1
19x2.75D	5,586	0.1	3,363	0.1
19x3.00D	1,735	0.0	504	0.0
19x3½	519	0.0	.....	...
19x4	8,529	0.1	5,268	0.1
19x4½	1,892	0.0	1,910	0.0
19x5	980	0.0	841	0.0
19x6	176	0.0	.....	...
20x2.75D	7,069	0.1	7,008	0.2
20x3½	4,718	0.1	677	0.0
20x4	1,679	0.0	1,114	0.0
20x4½	3,982	0.1	694	0.0
20x5	21,032	0.3	641	0.0
20x6	975	0.0	.....	...
21x2.75D	.....	...	1,962	0.0
21x3½	14,336	0.2	1,566	0.0
21x4	2,256	0.0	611	0.0
21x4½	2,417	0.0	1,349	0.0
21x5	153	0.0	205	0.0
21x6	358	0.0	302	0.0
High Pressure				
30x3½	3,189	0.0	2,118	0.0
32x4	520	0.0	201	0.0
32x4½	619	0.0	312	0.0
34x4½	208	0.0	211	0.0
18" Truck				
18x5	630	0.0	284	0.0
18x6	141	0.0	.....	...
18x7	13,982	0.2	3,268	0.1
18x8	954	0.0	147	0.0
20" Truck				
20x5	1,057,222	14.0	601,088	13.3
20x6	460,427	6.1	138,697	3.1
20x7	115,479	1.5	58,986	1.3
20x8	45,896	0.6	25,706	0.6
20x9/10	7,882	0.1	2,870	0.1
20x10.50	701	0.0	202	0.0
20x11	295	0.0	197	0.0
22" Truck				
22x7	823	0.0	601	0.0
22x8	7,546	0.1	4,331	0.1
22x9/10	4,283	0.1	1,051	0.0
24" Truck				
24x5	54	0.0	.....	...
24x6	3,333	0.0	2,294	0.0
24x7	7,807	0.1	4,282	0.1
24x8	12,936	0.2	10,633	0.2
24x9/10	7,307	0.1	4,802	0.1
24x11	373	0.0	20	0.0
Drop Center Tractor				
24x6.00S	3,339	0.0	.....	...
24x8.00T	10,948	0.1	3,469	0.1
28x8.00T	3,804	0.1	1,265	0.0
36x6.00S	8,835	0.1	740	0.0
36x8.00T	643	0.0	.....	...
Clincher Motorcycle				
24x3	134	0.0	475	0.0
Clincher Auto				
30x3½	4,382	0.1	2,157	0.0
Airplane (Drop Center)				
18x3	474	0.0	.....	...
Totals	7,494,717	...	4,505,416	...

Patents and Trade Marks

MACHINERY

United States

1,959,336. **Automatic Cycle Controller.** F. J. Bast, Queens Village, and L. C. Irwin, assignors to Charles J. Tagliabue Mfg. Co., both of Brooklyn, all in N. Y.

1,959,341. **Shoe Upper Cementer.** C. H. Bowlen, assignor to I. L. Keith, both of Haverhill, Mass.

1,959,431. **Tire Spreader.** C. W. King, assignor of ½ to G. M. Seewald, both of Memphis, Tenn.

1,959,488. **V-Belt Apparatus.** J. Meyer, Berlin-Wilmersdorf, Germany.

1,959,760. **Ball Winder.** H. N. Huse, Providence, R. I.

1,960,353. **Forming Body.** J. M. Smith, assignor to Plant Rubber & Asbestos Works, both of San Francisco, Calif.

1,960,427. **Tire Machine.** A. O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Mich.

1,960,583. **Mold Making.** J. W. Harding, assignor to *South Bend Tribune*, both of South Bend, Ind.

1,960,727. **Hydraulic Toggle Press.** J. W. Brundage, assignor to Summit Mold & Machine Co., Akron, O.

1,960,822. **Tire Apparatus.** J. T. Maney, assignor to Vernon Tool Co., Ltd., both of Los Angeles, Calif.

1,961,499. **Tire Groover.** C. A. Kunkel, Cincinnati, O.

1,961,725. **Tire Builder.** A. O. Abbott, Jr., Grosse Pointe Park, assignor to Morgan & Wright, Detroit, both in Mich.

1,961,726. **Tire Tester.** A. O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Mich.

1,961,727. **Tire Shaper and Bagger.** A. O. Abbott, Jr., Grosse Pointe Park, assignor to Morgan & Wright, Detroit, both in Mich.

1,961,755. **Thread Tester.** B. H. Foster, Maplewood, N. J., assignor to Morgan & Wright, Detroit, Mich.

1,962,020. **Thread Tester.** R. F. Lee and A. R. Bloxham, assignors to Dunlop Rubber Co., Ltd., all of Birmingham, England.

1,962,028. **Thread Tester.** E. A. Murphy and R. G. James, both of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, England.

1,962,029. **Continuous Thread Supplier.** E. A. Murphy and R. G. James, both of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, England.

1,962,581. **Rolling Mill Drive Mechanism.** W. R. Carroll, New Haven, assignor to Farrel-Birmingham Co., Inc., Ansonia, both in Conn.

1,962,630. **Bias Cut Strip Separator.** H. Willshaw, Wylde Green, and H. Smith and F. A. Davenport, both of Birmingham, all in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

1,963,013. **Tube Splicer.** W. J. Breth, assignor to General Tire & Rubber Co., both of Akron, O.

Dominion of Canada

341,894. **Tire Patch Vulcanizing Outfit.** G. S. Dawe, Nortdale, Australia.

342,010. **Plastic Material Treater.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of H. D. Stevens, Akron, O., U. S. A.

United Kingdom

404,999. **Tire Vulcanizing Press.** C. Macbeth, Birmingham.

405,001. **Thread Tester.** Dunlop Rubber Co., Ltd., London, and R. F. Lee and A. R. Bloxham, both of Birmingham.

405,009. **Mat Mold.** Redfern's Rubber Works, Ltd., and J. A. Redfern, both of Hyde.

405,032. **Yarn Treating Device.** J. E. C. Bongrand, Paris, and L. S. M. Lejeune, Nord, both in France.

405,512. **Rubber Crinkling Apparatus.** L. Mellersh-Jackson, London, assignee of J. J. Galligan and W. J. Robinson, both of Providence, R. I., U. S. A.

405,910. **Bathing Cap Vulcanizer.** I. B. Kleinert Rubber Co., Ges., Hamburg, Germany.

406,619. **Pile Fabric Apparatus.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

Germany

596,959. **Bias Strip Cutter.** Deutsche Dunlop Gummi-Co. A.G., Hanau a.M.

597,278. **Vulcanizer.** A. Scholz, Coesfeld i. W.

599,057. **Toy Ball Form Press.** Deutsche Dunlop Gummi Compagnie A.G., Hanau a.M.

PROCESS

United States

1,959,368. **Cementing a Well Casing.** C. B. Kennedye, assignor to Kennedye Oil Field Devices, Inc., both of St. Louis, Mo.

1,959,460. **Puncture-Proof Tube.** J. R. Crossan, Wadsworth, O.

1,959,902. **Disintegrating Cellulosic Material.** G. H. Carnahan, New York, N. Y., assignor to Intercontinental Rubber Co., Wilmington, Del.

1,960,437. **Lining for Rubber.** G. J. Foley, assignor to Naugatuck Chemical Co., both of Naugatuck, Conn.

1,961,108. **Fireproofing Cellulosic Material.** M. Leatherman, Hyattsville, Md., dedicated to the free use of the public in the territory of the U. S. A.

1,961,536. **Oscillating Joint.** L. Thiry, Huy, Belgium.

1,961,908. **Attaching Surfaces by Rubber.** A. L. Murray, Auburn, Ind.

1,961,916. **Artificial Leather.** J. C. Sherman, Gorham, Me., assignor to Brown Co., Berlin, N. H.

Dominion of Canada

341,954. **Inductance Coil.** Canadian Marconi Co., Montreal, P. Q., assignee of F. E. Robinson, Colchester, England.

342,112. **Uniting Metal and Rubber.** Goodyear Tire & Rubber Co., Akron, assignee of W. C. Calvert, Cuyahoga Falls, both in O., U. S. A.

342,126. **Fabric.** W. S. Libbey Co., assignee of W. S. Libbey, both of Lewiston, Me., U. S. A.

342,267. **Decorative Article.** B. F. Goodrich Co., New York, N. Y., assignee of C. W. Leguillon, Akron, O., both in the U. S. A.

United Kingdom

405,120. **Ornamenting Rubber.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and E. A. Murphy, Birmingham.

405,416. **Connecting Uppers to Soles.** R. Ashworth, Elton, Bury.

405,668. **Firelighter.** G. N. Thomson, Exmouth, and C. K. Bamber, London.

405,689. **Vulcanizing Rubber.** Peachey Textiles, Ltd., P. B. Addington, and W. Court, all of London.

405,815. **Connecting Uppers to Soles.** Magyar Ruggyantaarugyar Reszvenytarsasag, assignee of Dr. Dorogi es Tarsa Gummigyar R. T., and I. and L. Dorogi, all of Budapest, Hungary.

405,970. **Compound Fabric.** P. H. Head, Attenborough.

405,979. **Pulp Preparation.** J. B. Hawley, Geneva, Ill., U. S. A.

405,984. **Molding Lamp Shades from Pulp.** J. B. Hawley, Geneva, Ill., U. S. A.

406,222. **Surfacing Roads.** H. W. Cowling, Redhill.

406,848. **Toy.** F. Nadherny, Vienna, Austria.

407,361. **Firelighter.** H. C. Byrte, Wimborne.

Germany

598,607. **Inflatable Hollow Articles.** Radium Gummiwerke m.b.H., Koln-Dellbruck.

598,764. **Caring for Rubber Articles.** A. Klingenstein, Munich.

598,846. **Paper or Carton.** A. Ferretti, Milan, Italy. Represented by J. Reitstotter, Berlin-Steglitz.

598,943. **Pressed Masses from Hard Rubber Dust.** Allgemeine Elektricitats-Gesellschaft, Berlin.

599,162. **Rubber-Soled Shoes.** K. Heil, Neu-Isenburg.

599,257. **Valve Packing.** Pahl'sche Gummi & Asbest-Gesellschaft m.b.H., Dusseldorf-Rath.

599,524. **Making Waved Patterns on Material Surfaces.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.

CHEMICAL

United States

19,207 (Reissue). **Latex Plastic.** J. C. Patrick, Trenton, N. J.

1,959,556. **Aqueous Dispersion.** G. W. Trobridge, Sutton Coldfield, assignor to Dunlop Rubber Co., Ltd., London, both in England.

1,959,557. **Aqueous Dispersion.** D. F. Twiss, E. A. Murphy, and R. G. James, assignors to Dunlop Rubber Co., Ltd., Birmingham, England.

1,959,576. **Reclaiming Rubber.** T. J. Fairley, Alexandria, and R. Frye, Shreveport, assignors, by direct and mesne assignments, of ½ to W. J. Hunter and ½ to M. P. Hunter, both of Shreveport, all in La.

1,959,701. **Dipping Compound.** J. Balog, assignor to G. Balog, both of Vienna, Austria.

1,960,197. **Accelerator.** M. H. Zimmermann, Rye, N. H., assignor to Firestone Tire & Rubber Co., Akron, O.

1,960,205. **Accelerator.** R. F. Dunbrook, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,960,209. **Waterproofing Composition.** W. L. Holter, Newton, Mass., assignor to Van Schaack Bros. Chemical Works, Inc., Chicago, Ill.

1,960,250, 1,960,251, 1,960,252, and 1,960,-253. **Coating Composition.** J. Mano, Flushing, assignor to Hosnoler Corp., New York, both in N. Y.

1,960,445. **Aqueous Dispersion.** J. McGavack, Leonia, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,961,306. **Electrical Insulating Material.** W. S. Smith, Newton Poppleford; H. J. Garnett, Sevenoaks; J. N. Dean, Orpington; and H. C. Channon, W. Gardner, and H. F. Wilson, all of London, all in England.

1,962,460. **Soluble Polysulphide and Organic Compound.** J. C. Patrick, Trenton, N. J.

1,962,511. **Coloring Rubber.** H. Krzikalla, Ludwigshafen a. Rhine; A. Koch, Niedernhausen in Taunus; and W. Scheurer, Ludwigshafen a. Rhine, all in Germany, assignors to General Aniline Works, Inc., New York, N. Y.

1,963,019. **Accelerator.** M. W. Harman, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

Dominion of Canada

342,111. **Accelerator.** Goodyear Tire & Rubber Co., assignee of H. R. Thies, both of Akron, O., U. S. A.

342,113. **Antiscorch Material.** Goodyear Tire & Rubber Co., assignee of H. R. Thies, both of Akron, O., U. S. A.

342,119. **Thread from Aqueous Dispersions.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. McGavack, Leonia, N. J., U. S. A.

342,164. **Antioxidant.** Wingfoot Corp., Wilmington, Del., assignee of A. M. Clifford, Akron, O., both in the U. S. A.

United Kingdom

405,099. **Accelerator.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, A. E. T. Neale, and J. A. Wilson, all of Birmingham.

405,291. **Porous Rubber.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and E. W. Madge and A. N. Ward, both of Birmingham.

405,311 **Improving Latex Penetration in Textiles.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

405,312. **Vulcanizing.** J. E. C. Bongrand, Paris, and L. S. M. Lejeune, Nord, both in France.

405,407. **Rubber Composition.** Dunlop Rubber Co. Ltd London· Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and D. F. Twiss, W. McCowan, and E. W. B. Owen, all of Birmingham.

405,876. **Floor Covering Composition.** Vedag Vereinigte Dachpappen-Fabriken A. G., Berlin, Germany.

405,939. **Rubber-Cement Composition.** Aktiebolaget Swedish Invention Corp., Stockholm, Sweden.

405,956. **Rubber Composition.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; E. A. Murphy, Birmingham; and A. B. Hatton, Manchester.

405,986. **Coating Composition.** F. W. Skirrow, Purley, and S. Whyte, Redhill.

405,987. **Proofing Permeable Material.** A. R. Trist, London.

406,117. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

406,379. **Accelerator.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

406,479. **Accelerator.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of L. H. Howland, Nutley, N. J., both in the U. S. A.

407,038. **Modified Rubber.** Rubber Growers' Association, Inc., and H. P. Stevens, both of London; J. G. Bearn, Wallington; and S. C. Stokes, South Woodford.

407,181. **Accelerator.** Henkel & Cie., Ges., Dusseldorf, Germany.

407,360. **Latex.** J. L. Strevens, Westminster, and W. B. Mitford, Chessington.

407,709. **Varnish.** H. Dreyfus, London.

407,914. **Proofing Resins.** British Thomson-Houston Co., Ltd., London, assignee of A. J. Sherburne, Schenectady, N. Y., U. S. A.

407,948. **Synthetic Resin.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of S. D. Shinkle, Passaic, N. J., both in the U. S. A.

Germany

598,733. **Rubber Vulcanizates.** Pure Calcium Products Co., Painesville, O., U. S. A. Represented by G. Bertram and K. Lengner, both of Berlin.

599,330. **Vulcanized Rubber Solutions.** Deutsche Oelfabrik Dr. Grandel & Co., Hamburg.

599,404. **Rubber Compounds.** Deutsche Dunlop Gummi Compagnie A.G., Hanau a.M.

599,405. **Concentrated Rubber Solutions.** Lack & Farben-Fabrik Halle Nietleben G.m.b.H., Halle a.d.S.-Nietleben, and F. Radulesco, Paris, France. Represented by E. Meier, Halle a.d.S.-Nietleben.

GENERAL

United States

19,183 (Reissue). **Preformed Expansion Joint.** A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,959,359. **Footwear.** H. C. Hebig, Miami, Fla., assignor of 55% to N. Littell, New York, N. Y.

1,959,367. **Well Casing.** C. B. Kennedye, University City, Mo.

1,959,382. **Shoe.** G. B. Newton, Chicago, Ill., assignor, by mesne assignments, to N. Littell, New Canaan, Conn.

1,959,411. **Syringe.** A. Dolmatch, Dover, N. J.

1,959,486. **Trousers.** I. M. Matheson and J. A. Wilkinson, both of Wellington, New Zealand.

1,959,497. **Animal's Tail Anti-Moving Device.** J. L. L. J. Peney, Lyon, France.

1,959,531. **Electroplating Apparatus.** K. C. D. Hickman and W. J. Weyerts, assignors to Eastman Kodak Co., all of Rochester, N. Y.

1,959,571. **Airless Tire.** G. C. Craig, Bloomington, Ill.

1,959,581. **Milking Machine Teat Cup.** C. H. Hapgood, Nutley, N. J., assignor to De Laval Separator Co., New York, N. Y.

1,959,630. **Pipe Elastic Coupling.** H. J. Keitel, Friedrichshafen-on-Bodensee, Germany.

1,959,838. **Valve Grinder.** A. Olsen, San Bernardino, Calif.

1,959,848. **Dynamo - Electric Brush Cable.** H. W. Abbott, St. Marys, Pa., assignor to Speer Carbon Co., a corporation of Pa.

1,959,956. **Imparting Elasticity to Paper.** H. Jackson, Garstang, England.

1,959,969. **Resilient Motor Support.** C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,959,991. **Floor Covering Protecting Strip.** J. J. Vaughan, assignor to T. Eaton Co., Ltd., both of Toronto, Ont., Canada.

1,960,137. **Packing Strip.** G. C. Brown, assignor to Durkee-Atwood Co., both of Minneapolis, Minn.

1,960,229. **Suspender Shirt Hold-Down Attachment.** E. S. Mix, assignor to Hickok Mfg. Co., Inc., both of Rochester, N. Y.

1,960,444. **Woven and Knitted Fabric Connection.** P. A. Linke, Summit, N. J., assignor to United States Rubber Co., New York, N. Y.

1,960,548. **Mineral Feed Block Former.** G. F. Pfeiffer, Quincy, assignor to Moorman Mfg. Co., Chicago, both in Ill.

1,960,645. **Sling Shot.** L. R. Parrish, assignor to Slingo Corp., both of Ocala, Fla.

1,960,690. **Elastic Retaining Band.** E. P. Blair, Paoli, Pa.

1,960,737. **Pea Sheller.** J. A. Galley, Edgecliff, and E. V. Galley, Randwick, both in N. S. W., Australia.

1,960,738. **Weed Gun.** C. L. Giezentanner, Montesano, assignor to Weed Destroyer Co., Inc., Aberdeen, both in Wash.

1,960,750. **Gasket.** J. W. Moore and V. C. Foster, assignors to American Cast Iron Pipe Co., all of Birmingham, Ala.

1,960,754. **Tractor Self - Connecting Coupling Device.** H. H. Robinson, assignor to Curtiss Aerocar Co., Inc., both of Opa Locka, Fla.

1,961,035. **Tire Valve Stem Cap.** E. J. Dowden, Gettysburg, S. D.

1,961,099. **Ski Pole Grip and Ring.** J. B. Dickson, Northampton, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.

1,961,181. **Carrying Case.** W. von der Heydt, Newark, N. J.

1,961,267. **Heel Mud Guard.** R. C. Vogt, West New York, N. J.

1,961,489. **Syringe.** G. N. Hein, San Francisco, Calif.

1,961,555. **Shoe Antiskid Attachment.** H. D. Driscoll, Tulsa, Okla.

1,961,583. **Packing.** L. S. Hamer, Long Beach, assignor to Chiksan Oil Tool Co., Fullerton, both in Calif.

1,961,670. **Aquatic Accessory.** A. Lazar, assignor of ½ to D. George, both of Chicago, Ill.
1,961,745. **Laminated Material.** H. F. Eckhardt, Cleveland, O., assignor to Mechanical Rubber Co., New York, N. Y.
1,961,910. **Footwear.** S. I. Pike, Jackson Heights, assignor to Sponge Rubber Shoe Co., Inc., New York, both in N. Y.
1,961,961. **2-Way Stretch Elastic Fabric.** J. S. Coldwell, Fall River, Mass.
1,962,021. **Garter.** H. Lobbenberg, Cologne, Germany.
1,962,073. **Horseshoe Reenforcement.** O. Harsem, Oslo, assignor to Imperator Hestesko Aktieselskap, Tonsberg, both in Norway.
1,962,143. **Shock Absorbing Tire.** J. B. Ford, Tulsa, Okla.
1,962,248 and 1,962,249. **Powder Puff.** M. Levy, New York, N. Y.
1,962,438. **Resistors.** J. A. Flanzer, Brooklyn, N. Y., and L. L. Jones, Oradell, N. J., assignors to Technidyne Corp., New York, N. Y.
1,962,472. **Extension Valve.** W. A. Anglemyer, Indianapolis, Ind.
1,962,526. **Basketball Shoe.** J. T. Riddell, Chicago, Ill.
1,962,585. **Extensible Device.** C. Faure-Roux, assignor to Etablissements Ch. Faure-Roux, both of St.-Chamond, France.
1,962,682. **Laminated Material.** W. Case, assignor to Bemis Bros. Bag Co., both of St. Louis, Mo.
1,962,746. **Vibration Damper.** R. K. Lee, assignor to Chrysler Corp., both of Detroit, Mich.
1,962,790. **Steel Retainer.** F. M. Slater, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J.
1,962,854. **Automobile Chassis Brush.** J. I. Anderson, assignor to J. I. Holcomb Mfg. Co., both of Indianapolis, Ind.
1,962,971. **Foot Treater.** J. F. Schipper, Miami, Fla.
1,962,989. **Brake Equalizer.** F. Gough, Oklahoma City, Okla.

Dominion of Canada

341,735. **Trouser Waist Band.** J. D. Best and A. A. Lind, co-inventors, both of Dunedin, Otago, New Zealand.
341,831. **Toy.** Magyar Ruggyantaarugyar Reszvénytarsasag, assignee of L. Turchanyi, both of Budapest, Hungary.
341,913. **Electric Warmer.** W. W. Lillard, Midland Park, N. J., U. S. A.
341,944. **Electric Heater.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of J. H. Payne, Ballston Spa, N. Y., U. S. A.
341,969. **Swimming Suit.** Jantzen Knitting Mills, assignee of C. C. Jantzen, both of Portland, Ore., U. S. A.
342,015. **Abdominal Belt.** J. Brohman, Los Angeles, Calif., U. S. A.
342,036. **Sole.** D. C. Hubbard, Auburn, Me., U. S. A.
342,045. **Lacrosse Stick.** J. Muir, Outremont, P. Q.
342,092. **Pressure Gage.** Dill Mfg. Co., Cleveland, assignee of J. C. Crowley, Cleveland Heights, both in O., U. S. A.
342,102. **Cap.** Eagle Knitting Mills, assignee of A. Goldstein, both of Milwaukee, Wis., U. S. A.
342,148 and 342,149. **Golf Club.** A. G. Spalding & Bros. of Canada, Ltd., Brantford, Ont., assignee of W. F. Reach, Springfield, Mass., U. S. A.
342,205. **Nursing Bottle.** P. N. Korchinski, Ituna, Sask.
342,223. **Flexible Mudguard.** A. W. Ray, Leigh-on-Sea, England.
342,263. **Inner Tube.** Dill Mfg. Co., Cleveland, assignee of W. F. Goff, Akron, both in O., U. S. A.
342,268. **Hose.** B. F. Goodrich Co., New York, N. Y., assignee of H. A. Bourne, Akron, O., both in the U. S. A.
342,269. **Valve.** B. F. Goodrich Co., New York, N. Y., assignee of H. E. Fritz, Barberton, and J. R. Hoover, Cuyahoga Falls, co-inventors, both in O., all in the U. S. A.
342,270. **Elastic Cord.** Hamilton Cotton Co., assignee of J. Roberts, both of Hamilton, Ont.
342,285. **Water Softener.** Permutit Co., assignee of E. Pick, both of New York, N. Y., U. S. A.

United Kingdom

403,799. **Mudguard.** A. W. Ray, Leigh-on-Sea.
403,895. **Bicycle Support.** B. M. A. G. Schulte, Helmond, Holland, and F. J. J. Van Nunen, Singapore, S. S.
403,986. **Power Unit Mounting.** F. Neale, Coventry.
404,088. **Motorcycle Frame.** Douglas Motors (1932), Ltd., and C. G. Pullin, both of Bristol.
404,129. **Book Support.** A. Hufschmid, Zurich, Switzerland.
404,175. **Vehicle Body.** E. Bugatti, Molsheim, France.
404,212. **Vehicle Suspension.** W. Noble, Detroit, Mich., U. S. A.
404,419. **Drawer Fitting.** E. A. Ford, Colwyn Bay.
404,553. **Chair.** M. Heller, Vienna, Austria.
404,752. **Meat Carver.** W. O. Green, London.
404,853. **Massage Appliance.** S. F. Bowser, Fort Wayne, Ind., U. S. A.
404,882. **Cable Joint.** Felten & Guilleaume Carlswerk A. G., Mulheim, Germany.
405,057. **Tube Support.** T. L. Leonard, London. (T. T. Draper, Granville, Sydney, Australia.)
405,150. **Suction Appliance.** A. D. Gladish, Buenos Aires, Argentina.
405,177. **Endless Vehicle Track.** L. Chevreau, Levallois-Perret, France.
405,217. **Dental Malformation Appliance.** S. J. F. Webb and E. Furneaux, both of Bishop's Stortford, and W. J. Brooks, Letchworth.
405,225. **Upholstery Molding.** A. Brooke, Coventry.
405,266. **Engine Mounting.** Ford Motor Co., Ltd., London.
405,270. **Package Wrapper.** Minnesota Mining & Mfg. Co., assignee of R. G. Drew, both of St. Paul, Minn., U. S. A.
405,316. **Beer Aerating Device.** L. Solomon, London.
405,344. **Wrapping Machine.** W. W. Triggs, London. (American Machine & Foundry Co., New York, N. Y., U. S. A.)
405,375. **Driving Belt.** H. Brammer, Kirkstall.
405,376. **Hair Waver.** A. E. Badge, London.
405,396. **Sock Suspender Grip.** A. Swidersky, Paris, France.
405,406. **Coffin.** J. Doleman, Oldham; J. Fletcher, Ashton-under-Lyne; and J. Beesley, Mossley.
405,419. **Window Rain Excluder.** L. Lynes and Beckett, Laycock & Watkinson, Ltd., both of London.
405,431. **Trawling.** J. Chant, Plymstock.
405,585. **Skin Stretcher.** A. W. O. Montag, Berlin, Germany.
405,586. **Drinking Glass Washer.** P. Vermeiren, Brussels, Belgium.
405,588. **Ventilating Footwear.** A. F. Kent, Cornwood.
405,595. **Refrigerator.** A. G. Borrington, London.
405,602. **Mat.** G. Gottlieb, Erlaa, Austria.
405,609. **Tire.** Dunlop Rubber Co., Ltd., London, and W. E. Hardeman and E. S. Tompkins, both of Birmingham.
405,671. **Catamenial Appliance.** G. F. Williams, J. T. Evans, and J. D. Williams & Co., Ltd., all of Manchester.
405,686. **Piston.** A. W. Simmons and Westinghouse Brake & Saxby Signal Co., Ltd., both of London.
405,704. **Battery Charging Signal.** G. Taylor, London.
405,733. **Plug.** C. B. Colston, Greenford.
405,742. **Beauty Face Mask.** S. Ironside, Ltd., and S. Grayson, both of London.
405,747. **Doorstop.** Silent Channel Co., Ltd., and G. H. Beaton, both of London.
405,790. **Tire.** A. H. Stevens, London. (Chrysler Corp., Highland Park, Mich., U. S. A.)
405,792. **Aeronautical Photography.** Barr & Stroud, Ltd., and J. W. French, both of Glasgow, Scotland.
405,796. **Land and Garden Roller.** A. J. W. Luttrell and A. McLean, both of Victoria, Australia.
405,811. **Heel Protector.** Industrie U. Handelsges., Vaduz, Liechtenstein.
405,841. **Scouring Appliance.** S. Schulhoff, Baltimore, Md., U. S. A.
405,859. **Felt Hat.** A. Sindermann, Vienna, Austria.
405,864. **Liquid Aerating Device.** E. Fernholz, Berlin, Germany.
405,901. **Self-Feeding Pad.** J. I. Krauer, London.
405,925. **Beauty Face Mask.** H. Moret, Brussels, Belgium.
405,927. **Tire.** B. Mundhass, Berlin, Germany.
405,947. **Player Piano.** Triumph Auto Pianos (1930), Ltd., and F. H. Saffell, both of London.
405,953. **Photo-sensitive Material Container.** F. F. Renwick, Gidea Park, Essex.
405,973. **Hollow Cylinder.** Flakice Corp., Wilmington, Del., assignee of C. Field, Brooklyn, N. Y., both in the U. S. A.
405,989 and 405,990. **Ice Making Apparatus.** Flakice Corp., Wilmington, Del., assignee of C. Field, Brooklyn, N. Y., both in the U. S. A.
406,000. **Cylinder.** C. A. Villiers, London, and E. F. Simmons, Chesham.
406,005. **Racket Frame Bender.** Dunlop Rubber Co., Ltd., London, and H. Willshaw and G. C. Brentnall, both of Birmingham.
406,073. **Inkwell.** L. Gunsberg, London.
406,089. **Reflector.** J. Cockshutt, Birkdale.
406,097. **Electric Flashlamp.** E. Wood, Manchester.
406,122. **Horseshoe.** N. Bland, (trading as Broomhill Patent Horseshoe Co.), Sheffield.

406,123. **Exerciser.** A. V. Terry, Redditch.
406,127. **Vent Peg.** D. Martin, London.
406,158. **Catamenial Appliance.** J. C. Tossell, Boscombe.
406,174. **Nurser Nipple.** R. H. Epstein, Brooklyn, N. Y., U. S. A.
406,211. **Window Cleaner.** P. Grosse, Dresden, Germany.
406,317. **Windscreen Regulator.** G. H. Pearce and E. Sanders, both of Worcester.
406,328. **Stuffing Box.** G. Tabozzi, Milan, Italy.
406,359. **Leather Working Machine.** Tanning Process Co., Boston, assignee of J. H. Connor, W. Newton, and M. M. Merritt, Middleton, all in Mass., U. S. A.
406,365. **Endless Chain Conveyer.** J. O. Farrer, London. (Continental Can Co., Inc., New York, N. Y., U. S. A.)
406,374. **Pipe Joint.** P. W. Forrest, Motherwell, and J. H. Stephen, Glasgow, both in Scotland.
406,432. **Hand Stamp.** E. Clifton and W. Jones, Clifton & Co., Ltd., both of London, and C. Ramsden, Romford.
406,478. **Moving Sign.** S. Arrobus, London.
406,529. **Arch Support.** A. E. Holloway, West Worthing.
406,535. **Rod Vibrator.** Karmac, Inc., Cleveland, O., U. S. A.
406,538. **Washing Machine.** H. Bloom and N. E. Ryckman, both of Hamilton, Ont., Canada.
406,539. **Compound Sheet Material.** J. & A. Hillman, Ltd., Dudley, and H. J. Sutton, Upper Gornal.
406,669. **Arch Support.** Frei & Kasser A. G., Zurich, Switzerland.
406,704. **Cable.** Standard Telephones & Cables, Ltd., and J. K. Webb, both of London.
406,718. **Hair Waver.** W. and H. MacDonald, Inverness, Scotland.
406,722. **Trap Shooting.** H. E. Jackson, Birmingham, and Imperial Chemical Industries, Ltd., London.
406,766. **Bottle Filling Apparatus.** E. C. Hopkins, London.
406,795. **Wheel.** J. M. MacLean, Seattle, Wash., U. S. A.
406,800. **Window Cleaner.** J. A. Redford and J. Birrell, both of Newcastle-on-Tyne.
406,821. **Game.** A. E. Trimmings, St. Neots.
406,896. **Tire.** V. C. Finlayson, Durban, South Africa.
406,923. **Electroplating Apparatus.** Soc. D'Electro-Chimie, D'Electro-Metallurgie & Des Acieries Electriques D'ugine, Paris, assignee of O. Bornhauser, Bas-Rhin, both in France.
406,930. **Water Softening Apparatus.** United Water Softeners, Ltd., London.
406,935. **Horseshoe.** E. L. P. M. Jamaux and F. P. Jourdain, both of Caen, Calvados, and M. A. C. Chartier, Seine, all in France.
406,938. **Tire.** S. Palli, Turin, Italy.
406,984. **Wood-Working Machine Feed Roller.** F. B. Robinson and T. Robinson & Son, Ltd., both of Rochdale.
407,129. **Toy Railway Rail.** M. A. Lore, Blackpool.
407,184. **Retractive Switch.** National Pneumatic Co., New York, N. Y., U. S. A.
407,207. **Spring Upholstery.** G. D. Peters & Co., Ltd., and W. L. Foster, both of Slough.
407,251. **Perforating Well Casings.** H. D. Elkington, London. (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, The Hague, Holland.)
407,279. **Pressure Gage.** Short & Mason, Ltd., London. (Taylor Instrument Cos., Rochester, N. Y., U. S. A.)
407,296. **Surgical Syringe.** A. Vaigle, Sutton, Surrey.
407,298 and 407,299. **Hair Waver.** A. Barbarin and R. Desriaux, both of Constantine, Algeria.
407,336. **Notice Board.** F. T. Dabbs, Ramsgate, and E. H. A. Leggatt, Woodford Green.
407,419. **Sling.** L. M. Jacks, London.
407,440. **Electric Clock.** Ericsson Telephones, Ltd., London, and H. J. Moore and C. W. Wilman, both of Beeston.
407,507. **Bin Cover.** F. W. Surridge, London.
407,610. **Medicament Container and Syringe.** Naamlooze Vennootschap Chemisch Pharmaceutische Fabriek Menoline (Menoline Drug Co.), The Hague, Holland.
407,787. **Mangler and Wringer.** F. Ellison, Cottingley.

Germany

597,176. **Seal for Balls.** Rheinische Gummi-u. Celluloid Fabrik, Mannheim-Neckarau.
598,276. **Seat Strapping.** Continental Gummi-Werke A.G., Hannover.
598,801. **Airplane Spring.** B. v. Loutzkoy, Berlin.
598,804. **Tread.** F. Kerschner, Vienna, Austria. Represented by B. Bloch, Berlin.
599,409. **Elastic Tire.** G. Kiewitt, Hamburg.

TRADE MARKS

United States

312,303. Fanciful label outlined by short dashes, and the word: **"Scorite."** Golf balls, etc. F. E. Wright, Flushing, N. Y.
312,325. **Softex.** Waterproofed sheetings and fabrics. I. B. Kleinert Rubber Co., New York, N. Y.
312,371. **Banjits.** Bandages. Surgical Dressings, Inc., Boston, Mass.
312,407. Inverted triangle containing representation of a bull dog, and above it, the words: **"Bull Dog."** Pneumatic tires. Yale Rubber Co., Inc., Akron, O.
312,461. **Dunlop.** Latex. Dunlop Plantations, Ltd., Birmingham, England.
312,575. **Silenta.** Erasers, etc. Wanderer-Werke Vorm. Winklhofer & Jaenicke A. G., Schonau, Germany.
312,661. **Belmont.** Packings. Belmont Packing & Rubber Co., Philadelphia, Pa.
312,780. **Sealtyte Leak-proof Tube.** Inner tubes. Firestone Tire & Rubber Co., Akron, O.
312,809. **Nimble.** Golf balls. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
312,909. **Cher - Velastic.** Rubberized fabrics. Archer Rubber Co., Milford, Mass.
312,923. Representation of a lotus flower, and the words: **"Lotus cloth."** Rubberized fabrics. Rubberized Fabrics, Inc., Kansas City, Mo.
312,951. **Sani-Sheet.** Sheeting. Landers Corp., Toledo, O.
313,018. Representation of a cup, and the words: **"Gold Cup."** Golf balls. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
313,020. Representation of an hour glass, and the word: **"Age-Tex."** Balloons. S. W. Anderson, doing business as Anderson Rubber Co., Akron, O.
313,061. Representation of a square label containing in each corner the letter: **"K"** set within a shield, and in the center of the label, the words: **"Kingtex disease preventative,"** and below, a representation of a crown, and the words: **"Fit for a King."** Prophylactic rubber articles. G. Aaronoff, doing business as Aaronoff Rubber Co., Brooklyn, N. Y.
313,128. **Hiflex.** Antioxidant. E. I. du Pont de Nemours & Co., Wilmington, Del.
313,145. **BurkoL.** Leather and rubber finishing composition. Burke Product Co., Camden, N. J.
313,160. **Mend - A - Tear.** Repairing patches. Leicester Rubber Co., Ltd., Leicester, England.
313,238. **Calcene.** Pigments and fillers for compounding with rubber. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
313,239. **Rusco.** Belting. Russell Mfg. Co., Middletown, Conn.
313,244. Label containing representation of 3 military caps, and the words: **"Red Caps Perfect Tested Prophylactic."** Prophylactic rubber articles. S. G. Boone, doing business as Boone Drug Sundries Co., Cincinnati, O.
313,276. Representation of the devil riding a tire; the devil's tail pointing to the sidewall of the tire, which contains the words: **"Overman Supermatic. The World's Best Tire."** Tires. Overman Cushion Tire Co., Inc., New York, N. Y.
313,280. Double circle containing representation of an iron cross on a black background and thereupon, horizontally and vertically, the word: **"Plant."** Packings. Plant Rubber & Asbestos Works, San Francisco, Calif.
313,283. **Biltmore.** Inner tubes. C. A. Dana and J. B. Pierce, receivers of Fisk Rubber Co., all of Chicopee Falls, Mass.
313,291. **Zenite.** Accelerator. E. I. du Pont de Nemours & Co., Wilmington, Del.
313,292. **Sperzo.** Dispersing agent. E. I. du Pont de Nemours & Co., Wilmington, Del.
313,321. **Supersport.** Tires, inner tubes, transmission and conveyer belts, packings, and hose. Societa Italiana Pirelli, Milan, Italy.
313,342. **Guardian.** Hose, packing, and belting. Pioneer Rubber Mills, San Francisco, Calif.
313,419. **Solux.** Antioxidant. E. I. du Pont de Nemours & Co., Wilmington, Del.
313,420. Black-edged circle containing the word: **"Lasco."** Tires and inner tubes. Laher Auto Spring Co., Inc., Oakland, Calif.
313,526. Representation of a repair patch and thereupon the words: **"Red Patch."** Ready-made tire repair patches, tire patch repair material, and reliners. Red's Patch & Reliner Co., Inc., Brooklyn, N. Y.
313,548. **RollstonE.** Paper machinery rolls. United States Rubber Co., New York, N. Y.

Market Reviews

CRUDE RUBBER

MUCH speculative activity, here and abroad, has been evident in the rubber markets. Ours has been sustained often by foreign purchases, including London, the Continent, and China. The demand of small Chinese growers for recognition as estates lends color to the belief that large speculative purchases are being made in Shanghai.

Statistics show no radical change, although shipments have not been so high as expected prior to the imposition of export duties and restrictive quotas on August 1. Cables early this month stated natives were overproducing large quantities of rubber, but an official denial was received from the Dutch Government.

June consumption figures, 40,242 tons, were up to expectations, with hopes of 1,000,000 tons consumption for 1934, to surpass the record of 1933.

Tire manufacturers, closed during the July 4 week for inventories, were expected to reopen on a shorter week since the rest of the summer is dull. The strike at The General Tire & Rubber Co. was settled, but smaller disturbances still threaten manufacturers in Akron. Yet with the strong public sentiment against large strikes as a result of the San Francisco affair, serious difficulties are not expected from probable strikes in Akron.

The automobile industry has been doing well. After a shutdown early in the month, factories reopened with larger schedules, and July output is expected to equal that of June. Manufacturers have concentrated on heavy sales promotion efforts which, combined with substantial price reductions, have apparently overcome the reluctance of buyers so evident early this month. In fact the steel industry has been operating at 30% capacity this summer, largely because of orders from automobile manufacturers.

Business in the Outside Market has shown little change over last month, but an occasional flurry in prices attracts buyers. If the restriction scheme effective August 1 appears to work and prices respond, a much better demand is expected.

Week ended June 30. Strong foreign markets, a revival of factory buying, and rumors that the International Rubber Regulation Committee would tighten up the restriction quotas made for a good rubber market. Prices gained steadily to close from 63 to 72 points higher than last week.

July closed at 14.06¢, against 13.38¢; September 14.33 against 13.66; December 14.70 against 14.01; January 14.84 against 14.12; March 15.03 against 14.35; and May 15.28 against 14.65.

A newspaper in Amsterdam, the *Handelsblad*, contained 2 items of interest to the market here. The first was a price disagreement between British and Dutch growers, the British apparently considering that 26¢ a pound, or 17.58¢ in United States currency, was a sufficient return; while the Dutch favored 35¢, or 23.80¢ in United States currency.

The other item, reported by *The Journal of Commerce,* follows: "The *Handelsblad* stated that a higher ratio for rubber control is likely as several large plantations, presumably in the Dutch East Indies, have been allotted quotas above their outputs. In connection with the previous day's announcement that natives are to be placed on a licensed production basis instead of under an export tax plan, the same newspaper pointed out that the potential capacity of Dutch East Indies native sections is considered below estimates."

Beginning next week tire factories will operate on a 4-day basis, with a 3-day shutdown this week for inventory taking. July consumption, for this reason, is expected to be from 32,000 to 35,000 tons, against 40,242 tons for June.

Estate stocks in May for the Malay states dropped to 5,954 tons, against 14,968 on April 30. Dealers' stocks, exclusive of 73,181 tons held in the Colony proper, were 1,259 tons, compared with 18,797 on April 30. Heavy exports reduced these figures, with production at a high rate, in anticipation of the export tax on July 1. It was these figures that led traders to believe that quotas would be tightened since the reduction as now planned will be only 12½% of the potential output in the 6 months from July 1; and if the potential output is overestimated, as seems to be indicated in the report quoted above, shipments may not drop so much as expected.

Automobile production last week was 70,330 units, against 71,293 the previous week, and 58,689 in the same 1933 week, according to *Cram's Automotive Reports.* Sales are declining despite the stimulus of lower prices and wide sales promotion. The area hit by the drought has lowered the average; while Detroit reports that automobile sales are holding the level of trading above the normal summer rate.

In the Outside Market factory buying was the best in several weeks, although the unsettled strike is a disturbing factor. The smaller factories and those making articles other than tires have been buying well.

July ribbed smoked sheets closed at 14⅛¢, against 13⅜¢ a week ago; August-September 14¼ against 13⅝; October-December 14⅝ against 14.00; and January-March 15.00 against 14⅜.

Week ended July 7. Speculative activity was strong this week, with transactions on Thursday totaling 7,630 tons. During our holiday on the Fourth the London market was much stronger; so when trading was resumed Thursday, prices gained 44 to 57 points. Profit taking resulted in losses of 15 to 24 points Friday, making the change for the week up 39 to 50 points.

July closed at 14.56¢ against 14.06¢; September 14.81 against 14.33; October 14.86 against 14.47; December 15.13 against 14.70; January 15.28 against 14.84; and March 15.49 against 15.03.

Reduction in shipment figures, below the amounts expected, also bolstered the market. Ceylon shipped only 3,305 tons in June, against 6,600 to 8,600 in previous months. Shipments from Malaya were 53,282 tons, compared with 69,403 in May, and with 41,311 in June, 1933. August 1 the new quotas go into effect so that further reductions will be made. These quotas are still being adjusted. The need of such a course is evident since native shipments from the Dutch East Indies have been 4½ times normal.

Trade Commissioner Brookhart in a cable from Batavia said: "When it is realized that well over 70,000 tons of native rubber have been produced and exported from Netherland India during the first 4 months of 1934, it is believed that rather drastic curtailment of this present rate of native production must be instituted in Netherland India so that the area may be able to comply with the terms of the restriction agreement."

Individual restriction may supplant the export tax so as to control this condition.

The market abroad seems to be strong. According to Symington & Wilson, the slightest recession in price brings substantial buying from London and the Continent. American business is still laggard.

Automobile manufacturers, taking inventory this week, will reopen on a 4-day schedule. Last week's operations, however, were stepped up to 80,936 units, against 70,330 the previous week, and 59,638 in the same week a year ago, according to *Cram's Auto-*

motive Reports. Sales during the first week of July were above expectations, especially in the low-priced field.

In the Outside Market things were quiet except for speculative activity. Prices gained in the short session, however, with good demand for c. i. f. offerings. The drop in Malay and Ceylon shipments below early estimates helped sentiment considerably. A report from the Far East indicates that more dry rubber than wet will be exported, and officials expect to reallocate proportional distribution on wet and dry rubber. Prior to July 1 the rubber factories in the East were working full capacity.

Prices gained about 3/8¢ as follows: July 14½¢ against 14⅛¢; August-September 14⅝ against 14¼; October-December 15.00 against 14⅝; and January-March 15⅜ against 15.00.

Week ended July 14. Official denial of rumors that the Dutch East Indies Government was having trouble restricting native production and that small Chinese growers wanted to be classed as estates prompted a spurt in rubber prices early in the week, but it was not sustained. The rubber market did not respond so actively as hoped to the rise in grains and cotton, and the trend in London turned soft so that for the week prices were only 2 to 11 points to the good after having been some 30 points higher. Volume reached 7,260 tons on speculative selling.

At the close July was 14.60¢ against 14.56¢; October 14.97 against 14.86; December 15.22 against 15.13; January 15.34 against 15.28; March 15.57 against 15.49; and May 15.85 against 15.83.

From Amsterdam came the following cable: "The rumor that natives were continuing to tap to capacity is officially denied by the home office. The exports of rubber during April amounted to 21,000 tons, during May, 27,000 tons, and a further 2,600 tons placed under customs control, which stock is outside the restriction scheme. During June, native exports from the entire Dutch East Indies amounted to 16,000 tons, which is regarded as very satisfactory. If no further rise in price occurs, the reduction of exports to the basic quota may soon be expected."

The National Automobile Chamber of Commerce reported that for the first half of 1934 automobile production was 75% higher than in the same period a year ago. June production was 7% under that of May, but 27% above that of June, 1933. Figures given show 1,802,442 units for the period, against 1,031,939 in 1933. June output was 328,000 units, against 351,802 in May and 257,613 in June, 1933. Individual reports bore out the Chamber's figures.

This picture lends strength to the forecast that 1,000,000 tons of rubber will be used this year, compared with the record consumption of 815,000 in 1933. Traders put June consumption at 40,242 tons, compared with 43,012 in May, and 51,329 in June, 1933. The high 1933 figure was a result of the inflation fears prevalent last summer, which resulted in a wave of buying in all commodities. In London traders point out these facts as an offset to possible native production in excess of quotas. As stated in the cable quoted above, this condition is unlikely; and if the price of raw rubber is not advanced too rapidly, the chances for restriction are so much greater. Production has been so unprofitable for so long that natives show a willingness not before evident to cooperate with estates in reducing the burdensome stocks of rubber now on hand.

Early in the week the Outside Market received a bit of shipment business with prices rising about 1/8¢. Listlessness on the part of buyers, however, reversed the trend. Spot rubber was moved in very small quantities, with the London market just as dull. At the close was a slight gain over last week's prices.

July closed at 14⅝¢ against 14½¢; August-September 14¾ against 14⅝; October-December 15⅛ against 15.00; and January-March 15⅜ against 15⅜.

Week ended July 21. Threats of a strike by another Akron factory depressed the market early in the week, but the settlement of The General Tire & Rubber Co. strike helped recover the losses, with the market ending the week with prices from one point up to 6 points down from a week ago. The news that the Dutch East Indies Government had imposed an export duty of 0.0618¢ per pound on native rubber also helped sentiment.

At the close, September was 14.82¢ against 14.84¢; December 15.20 against 15.22; January 15.28 against 15.34; March 15.58 against 15.57; and May 15.86 against 15.85.

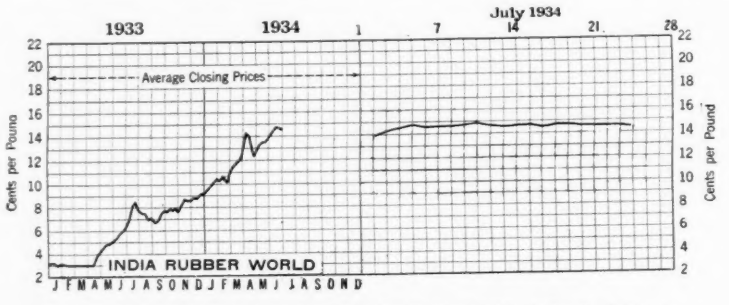
The market here has been credited with receiving much foreign support from London, Amsterdam, and Chinese interests. In fact traders wonder whether Shanghai is due for another rubber boom such as the one about 20 years ago when wealthy Chinese merchants invested heavily in rubber. In Amsterdam the Stock Exchange has been extremely quiet, but an effort to push rubber shares is discernible.

The strikers in The General Tire & Rubber plant are scheduled to return to work Monday. It is hoped that the new threats will not materialize. The present is a slack season for tire production, but makers of winter footwear are stepping up production and evening out the average which the drop in tire production would bring down.

Export duties on Dutch native rubber are scheduled to go into effect on August 1 for dry rubber and September 1 for wet rubber. The quotas imposed under the restriction agreement will gradually decrease output for the rest of the year, and it is hoped that the large stocks on hand will be reduced to workable form by December 31.

The consumption report was in line with expectations. A total of 40,242

(*Continued on page 74*)



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

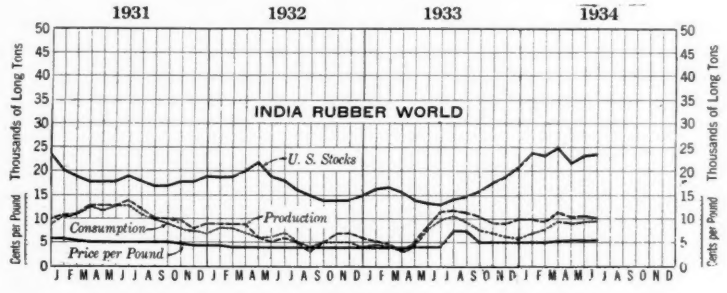
	June, 1934						July, 1934														
	25	26	27	28	29	30*	2	3	4†	5	6	7*	9	10	11	12	13	14*	16	17	18	19	20	21*
No. 1 Ribbed Smoked Sheet	13½	13⅞	13⅝	13⅞	14⅛	..	13⅛	14¼	..	14¾	14⅞	..	14⅞	14¾	14⅞	14⅛	14⅝	..	14⅝	14½	14⅛	14⅛	14⅝	..
No. 2 Ribbed Smoked Sheet	13⅛	13½	13¼	13½	13¾	..	13⅞	13⅞	..	14⅞	14⅛	..	14⅛	14⅞	14⅞	14⅞	14¼	..	14¼	14⅞	14¼	14¼	14⅛	..
No. 3 Ribbed Smoked Sheet	12⅞	13¼	13	13¼	13⅜	..	13⅞	13½	..	13⅛	13¾	..	13¾	14	14⅛	13⅞	13⅞	..	13⅞	13¾	13⅞	13⅞	13¾	..
No. 4 Ribbed Smoked Sheet	12⅝	13	12¾	13	13⅛	..	13	13¼	..	13¾	13⅞	..	13⅞	13¾	13⅞	13¾	13⅝	..	13¾	13½	13⅛	13⅛	13⅞	..
No. 1 Thin Latex Crepe..	15⅜	15⅛	15⅞	15⅝	16	..	15⅞	16¼	..	16½	16⅜	..	16⅜	16⅝	16⅝	16⅜	16⅜	..	16⅜	16¼	16⅜	16⅜	16¼	..
No. 1 Thick Latex Crepe.	15¼	15⅞	15⅞	15½	15⅞	..	15¾	16⅛	..	16⅜	16¼	..	16¼	16½	16½	16¼	16¼	..	16¼	16⅛	16¼	16¼	16⅛	..
No. 1 Brown Crepe	11⅞	11½	11¾	11½	11¾	..	11½	11⅞	..	12¼	12⅛	..	12⅛	12⅜	12⅜	12¼	12¼	..	12⅛	12	12¼	12¼	12⅛	..
No. 2 Brown Crepe	11⅞	11¼	11	11⅞	11⅞	..	11¼	11¾	..	12	11⅞	..	11⅞	12⅛	12⅛	12	12	..	11⅞	11¾	12	12	11⅞	..
No. 2 Amber	11⅞	11½	11¾	11½	11¾	..	11½	11⅞	..	12¼	12⅛	..	12⅛	12⅜	12⅜	12¼	12¼	..	12⅛	12	12¼	12¼	12⅛	..
No. 3 Amber	11⅛	11¼	11	11¼	11⅜	..	11¼	11¾	..	12	11⅞	..	11⅞	12⅛	12⅛	12	12	..	11⅞	11¾	12	12	11⅞	..
No. 4 Amber	10⅞	10¾	10½	10¾	10⅞	..	10¾	11⅛	..	11⅜	11¼	..	11¼	11½	11½	11⅜	11⅜	..	11¼	11⅛	11⅜	11⅜	11⅜	..
Rolled Brown	8¾	9	8¾	9	9⅛	..	9	9¼	..	9⅝	9½	..	9½	9¾	9¾	9⅝	9½	..	9¼	9⅛	9½	9⅜	9⅜	..

* Closed. † Holiday.

RECLAIMED RUBBER

BUSINESS in reclaimed rubber slackened its pace considerably in July as compared with June. The present prices for reclaims are so favorable to consumers, compared with those for crude rubber, that many manufacturers are making commitments covering the balance of the year. Prices are well maintained, and the outlook indicates an early improvement.

The distinct gain in the ratio of reclaim consumption to that of crude rubber has steadily increased thus far this year. Reclaiming plants are operating on summer schedules of moderate production. Market quotations remain unchanged from the figures of a month ago.



Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1930	157,967	153,497	41.5	24,008	9,468
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933	99,974	81,612	20.1	20,746	3,583
1934					
January	9,828	7,000	17.3	24,393	333
February	9,504	7,646	18.8	23,356	282
March	11,479	9,683	20.3	25,113	354
April	10,185	9,387	20.9	22,033	394
May	10,848	9,500	22.1	22,887	559
June	10,820	9,459	23.5	23,664	444

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

New York Quotations

July 25, 1934

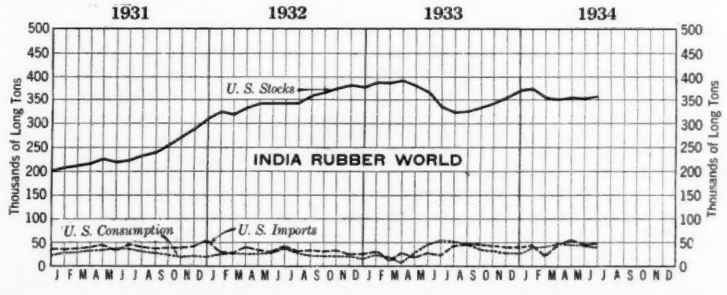
	Spec. Grav.	Cents per Lb.
High Tensile		
Super-reclaim, black	1.20	8¾/9
red	1.20	7 /7¼
Auto Tire		
Black	1.21	5 /5¼
Black selected tires	1.18	5¼/5½
Dark gray	1.35	6¼/6½
White	1.40	9¼/9½
Shoe		
Unwashed	1.60	6¼/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	13 /
No. 2	1.10	7¼/7¾
Truck Tire		
Truck tire, heavy gravity	1.55	5¼/6
Truck tire, light gravity	1.40	6 /6¼
Miscellaneous		
Mechanical blends	1.60	4¼/4½

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	332,000	379,000	38,360	92,567	36,802	709,840	670,250	518,187
1933	411,615	405,687	364,541	55,606	86,438	48,744	845,291	818,370	489,029
1934									
January	46,204	40,413	368,660	45,768	90,272	51,427	81,487	77,200	510,359
February	31,032	40,609	357,094	53,063	92,482	52,580	88,239	82,100	502,155
March	44,605	47,097	353,242	54,722	94,314	59,224	92,070	78,000	506,494
April	45,662	44,947	351,981	56,251	96,108	63,381	84,153	88,400	508,795
May	47,954	43,012	351,329	57,921	96,197	89,758	115,612	79,300	537,278
June	49,683	40,242	358,149	46,698	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.



United States Stocks, Imports and Consumption

CONSUMPTION of crude rubber by United States manufacturers for June amounted to 40,242 long tons, against 43,012 long tons for May, a decrease of 6.4% under May and 20.7% below June, 1933, according to R.M.A. statistics. Consumption for June, 1933, was 50,743 (revised) long tons.

Crude rubber imports for June were 49,683 long tons, an increase of 3.6% over May and 118.6% above June, 1933.

The estimated total domestic stocks of crude rubber June 30 were 358,149 long tons, against May 31 stocks of 351,329 long tons, an increase of 1.9% above May 31 stocks and 6.5% above stocks of June 30, 1933.

Crude rubber afloat for the United States ports on June 30 was 46,698 long tons, compared with 57,921 long tons afloat on May 31 and 63,608 long tons afloat on June 30, 1933.

London and Liverpool Stocks

Week Ended	Tons	
	London	Liverpool
June 30	45,711	54,161
July 7	47,607	54,966
July 14	48,908	55,141
July 21	49,654	55,749

COMPOUNDING INGREDIENTS

BUSINESS in rubber chemicals such as accelerators, antioxidants, etc., was considerably reduced in volume in July as compared to June, owing in large part to the labor situation in the automobile and other industries employing rubber products. For example, the strike situation in San Francisco made it difficult for manufacturers in that area to supply their plants with needed raw materials. The present curtailment of rubber goods production is expected to increase further with the result of reducing the tonnage of supplies required. The sales curve of rubber chemicals follows closely that of the output of the rubber industry, especially that of tires. The prices of rubber chemicals are firmly maintained.

CARBON BLACK. Consumption schedules during the second quarter of the year and shipments for a part of that time exceeded production. Present production schedules in the rubber industry indicate a reduced demand during the third quarter particularly as many consumers are carrying rather heavy inventories of finished goods which must be moved before stocking new manufacturing supplies. Indications are that carbon black production is closely adjusted to consumption as provided in the code of that industry.

FACTICE. Economic and legislative conditions influencing the relative market values of vegetable oils have placed rapeseed oil on a price level below that of other vegetable oils used in making factice. This is a situation not often experienced, and since rapeseed oil is the oil par-excellence for factice, the superior grades of rubber substitutes now have a price advantage as well as their normal natural one.

MINERAL RUBBER. The consumption of mineral rubber has greatly expanded so far this year, entirely because of the pressure of expanding prices for crude rubber. This increased use is notable more especially in mechanical rubber goods where volume cost is vital and conditions of quality permit compounding with mineral rubber and reclaims to requisite price adjustments.

TITANIUM PIGMENTS. While the market for these goods has shown some seasonal contraction, the volume taken by the rubber industry, still very satisfactory, is considered somewhat in advance of the tonnage usual for this time of the year. Prices are firm on all grades, and contracts are being accepted for the last half of the year on the same price levels as prevailed during the first half.

ZINC OXIDE. During July the demand for zinc oxides held up to normal seasonal proportions, with prices firm and unchanged.

New York Quotations

July 25, 1934

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered..	lb.	$0.01¼/$0.03½
Rottenstone, domestic..	lb.	.02½/ .05
English	ton	
Silica, 15	ton	47.50
Tripoli	ton	
Accelerators, Inorganic		
Lead, white, dry (bbls.)	lb.	.06½
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06½
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06½
Accelerators, Organic		
A-1 (Thiocarbanilid)	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-7	lb.	.53 / .65
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
Accelerator 49	lb.	.40 / .50
Acrin	lb.	
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Anhydroformaldehyde-para-toluidine	lb.	
Barak	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
DBX	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.46 / .56
DPG	lb.	.36 / .46
du Pont 808	lb.	
833	lb.	
Ethylidine aniline	lb.	
Formaldehyde aniline	lb.	
Guantal	lb.	.42 / .51
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.37
Lead oleate, No. 999	lb.	.085
Witco	lb.	.10
Lithex	lb.	
Monex	lb.	
Novex	lb.	
Pipsol X	lb.	3.55 / 4.00
Plastone	lb.	
R-2	lb.	1.55 / 1.90
base	lb.	4.55 / 5.00
R & H 40	lb.	
50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tetrone A	lb.	
Thio	lb.	
Thiocarbanilid	lb.	.20
Thionex	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	$0.58 /$0.60
Tuads	lb.	
Ureka	lb.	.62 / 1.00
Blend B	lb.	
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
ZBX	lb.	
Z-88-P	lb.	.48 / .60
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.66 / 2.91
glacial (carboys)	100 lbs.	14.00
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
BLE	lb.	
Flectol A	lb.	.54 / .60
B	lb.	.54 / .60
H	lb.	
Hiflex B	lb.	
Neozone	lb.	
Oxynone	lb.	.66 / .90
Parazone	lb.	
Permalux	lb.	
Resistox	lb.	.52 / .65
Solux	lb.	
VGB	lb.	
Zalba	lb.	
Alkalies		
Caustic soda, 50% liquid, Columbia	100 lbs.	2.25
70%	100 lbs.	2.30
solid	100 lbs.	2.60 / 3.50
Antiscorch Materials		
Retarder-W	lb.	
R. H. Cumar	lb.	.075 / .085
UTB	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Asbestos	ton	
Cotton flock, dark	lb.	.10½/ .13
dyed	lb.	.50 / .85
white	lb.	.14 / .20
Rayon flock, colored	lb.	1.60 / 1.75
white	lb.	1.40
Brake Lining Saturants		
B. R. C. No. 553	lb.	.015 / .017
B. R. T. No. 3	lb.	.015 / .017
Colors		
BLACK		
Bone	lb.	$0.05½/$0.15½
Lampblack (commercial)	lb.	.07
BLUE		
Brilliant	lb.	
Prussian	lb.	.35½
Toners	lb.	.80 / 3.50
Ultramarine, dry	lb.	.10
BROWN		
Mapico	lb.	.13
Sienna, Italian, raw	lb.	.12½
GREEN		
Brilliant	lb.	
Chrome, light	lb.	.20
medium	lb.	.20
oxide	lb.	.21½
Dark	lb.	
Guignet's	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48
7-A	lb.	.33
Z-2	lb.	.20
Chinese	lb.	
Crimson	lb.	
Iron Oxides Rub-Er-Red	lb.	.09¼
Mapico	lb.	.09¼
Medium	lb.	
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb.	.04½/ .04¾
Astrolith	lb.	
Azolith	lb.	.04¾/ .04¾
Cryptone-19	lb.	.06 / .06¼
CB-21	lb.	.06 / .06¼
Sunolith	lb.	
XX-20 Zinc Sulphide	lb.	.10¼/ .10¼
86	lb.	.10½/ .10¼
Rayox	lb.	

Titanox-A	lb.	$0.17 /$0.18¾
B	lb.	.06 / .06½
C	lb.	.06 / .06½
Zinc Oxide		
Azo 35 (35% leaded)	lb.	.05¾/ .06
Z (10% leaded)	lb.	.06¼/ .06½
ZZ (3-5% leaded)	lb.	.06¼/ .06½
ZZZ (lead free)	lb.	.06½/ .06¾
Black label (lead free)	lb.	.06½
Ceramatone	lb.	.06½/ .06¾
F. P. Florence, Green Seal-8	lb.	.09⅜/ .09⅝
Red Seal-9	lb.	.08⅜/ .08⅝
White Seal-7 (bbls.)	lb.	.10⅝
Green label (lead free)	lb.	.06½
seal, Anaconda	lb.	.09⅜/ .09⅝
Horsehead (lead free) brand Special-3	lb.	.06½/ .06¾
XX Red-4	lb.	.06½/ .06¾
72	lb.	.06½/ .06¾
78	lb.	.06½/ .06¾
103	lb.	.06½/ .06¾
Kadox Black Label-15	lb.	.09⅜/ .09⅝
Blue Label-16	lb.	.08⅜/ .08⅝
Red Label-17	lb.	.07 / .07¼
Lead free (all grades) Anaconda	lb.	.06½/ .06¾
Leaded, 5%, Anaconda	lb.	.06¼/ .06½
35%, Anaconda	lb.	.05¾/ .06
Red label (lead free)	lb.	.06½
seal, Anaconda	lb.	.08¾/ .08⅝
U.S.P. (bbls.)	lb.	.12¾
U.S.P. X (bbls.)	lb.	.12½
White seal, Anaconda	lb.	.10⅝
YELLOW		
Lemon	lb.	
Mapico	lb.	.09½
Ocher, domestic	lb.	.0195/ .02¾
Toners	lb.	2.50

Dispersing Agents

Bardex	lb.	.023 / .025
Bardol	lb.	.021 / .023
Darvan	lb.	

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine	ton	15.00
Barytes (f.o.b. St. Louis), (bbls.)	ton	23.00
off color, domestic	ton	22.50 /25.00
white, imported	ton	32.50 /35.00
Blanc fixe, dry precip.	ton	70.00 /75.00
pulp	ton	42.50
Calcene	100 lbs.	1.75 / 2.15
Infusorial earth	lb.	.03 / .05
Kalite No. 1	ton	
No. 3	ton	
Suprex, white, extra light	ton	60.00 /75.00
heavy	ton	45.00 /60.00
Whiting Chalk, precipitated	lb.	.04¼/ .04¾
Columbia brand	ton	8.00 /13.00
Domestic	ton	
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Sussex	ton	
Witco	ton	15.00
Wood flour (f.o.b. New Hampshire)	ton	21.00 /55.00

Fillers for Pliability

Flex	lb.	
Fumonex, c.l., f.o.b. works, bags	lb.	.03
l.c.l., f.o.b. warehouse	lb.	.05½/ .07
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	

Finishes

IVCO lacquer, clear	gal.	2.60 / 2.90
colors	gal.	2.70 / 3.35
Rubber lacquer, clear	gal.	
Colored	gal.	
No. 106	gal.	3.00
Starch, corn, pwd.	100 lbs.	3.21 / 3.41
potato	lb.	.05¼/ .06
Talc, dusting	ton	20.00
Pyrax	ton	

Latex Compounding Ingredients

Accelerator 552	lb.	
Aquarex	lb.	
Aresco	lb.	.28 / .40
Casein, domestic	lb.	.12½/ .13
Catalpo	ton	
Colloidal color pastes	lb.	
sulphur	lb.	
zinc oxide	lb.	
Disinfectants	lb.	
Dispersaid	lb.	1.50
Dispersed Antox	lb.	
Emo, brown	lb.	.12
white	lb.	.12
Emulsified Heliozone	lb.	
Fac-cel B	lb.	
C	lb.	
Igepon A	lb.	
Nekal BX (dry)	lb.	
Neozone L	lb.	
Palmol	lb.	.085
Tepidone	lb.	
Vulcan colors	lb.	

Mineral Rubber

B. R. C. No. 20	lb.	$0.014 /$0.016
Black Diamond	ton	
Genasco Hydrocarbon, granulated, (fact'y)	ton	25.00 /27.00
solid	ton	
Gilsonite Hydrocarbon (factory)	ton	
Hydrocarbon, hard	ton	
soft	ton	
Parmr Grade 1	ton	23.00
Grade 2	ton	23.00
265°	ton	

Mold Lubricants

Rusco mold paste	lb.	.12 / .30
Sericite	ton	65.00
Soapbark (cut)	lb.	.09½/ .10
Soapstone	ton	15.00 /25.00

Oils

Castor, blown	lb.	.11¼/ .11¾
Poppyseed (bbls.)	gal.	
Rapeseed, refined (bbls.)	gal.	.40

Reclaiming Oils

B. R. V.	lb.	.039 / .041
S. R. O.	lb.	.012 / .014

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	lb.	.0535/ .0825
Arrow Compact Black	lb.	
Century (delivered)	lb.	.0445/ .0535
"Certified" Cabot	lb.	
Spheron	lb.	
Disperso (delivered)	lb.	.0445/ .0535
Dixie, c.l., f.o.b., New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Gastex	lb.	.03 / .07
Kosmos, c.l., f.o.b. New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Micronex	lb.	.0535
Beads	lb.	
Ordinary (compressed or uncompressed)	lb.	.0535
Carbonex	lb.	.030 / .0375
S	lb.	.0315/ .040
Clays		
Aerfloted Paragon	ton	7.50 /10.00
Suprex, No. 1, selected	ton	10.00
No. 2, standard	ton	7.50
Blue Ridge, dark	ton	
China	ton	
Dixie	ton	
McNamee	ton	
Par	ton	
Perfection	ton	7.50 / 9.00
Standard	ton	
Cumar EX	lb.	.0275/ .0375

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Para-Dors	lb.	
Rodo No. 0	lb.	
No. 10	lb.	

Rubber Substitutes or Factice

Amberex	lb.	.13¾
Black	lb.	.06 / .08
Brown	lb.	.07 / .11
White	lb.	.07½/ .12

Softeners

B. R. C. No. 555	lb.	.012 / .014
B. R. T. No. 7	lb.	.015 / .017
Burgundy pitch	lb.	.05 / .06
(net weight)	lb.	.06 / .08
Corn oil, crude (bbls.)	lb.	.06¾
Cycline oil	gal.	.15 / .28
Fluxol	ton	
Genasco liquid asphalt	gal.	
Hardwood pitch, c.l.	ton	23.50 /25.00
Palm oil (Witco)	lb.	.05
Petrolatum, light amber	lb.	.04
Pigmentar (drums)	gal.	.23 / .25
Pigmentaroil (drums)	gal.	.23 / .25
Pine oil, dest. distilled (drums)	gal.	.47 / .49
pitch	bbl.	5.75
tar, specification retort (drums)	gal.	.23 / .26
Plastogen	lb.	
Rosin oil, compounded	gal.	.33 / .38
Rubtack	lb.	.10
Sperso	lb.	
Tackol	lb.	.085 / .18
Tonox	lb.	
Witco, No. 20	gal.	.15

Softeners for Hard Rubber Compounding

Resin C-55°	lb.	.0125/ .0145
70°	lb.	.0125/ .0145
85°	lb.	.0125/ .0145

Solvents

Benzol 90% (drums)	gal.	.28
Bondogen	gal.	
Carbon bisulphide (drums)	lb.	.05½/ .12
tetrachloride	lb.	.05¼
Dipentene, commercial	gal.	.34 / .44
Rubber (f.o.b. Group 3 refineries)	gal.	$0.06⅞
Toluol	gal.	.39
Turpentine, steam distilled	gal.	.47
wood, dest. distilled (drums)	gal.	.40

Stabilizers for Cure

Laurex, ton lots	lb.	
Stearex B	lb.	.08 /$0.09½
Beads	lb.	.07½/ .09
Stearic acid, dbl. pres'd	lb.	.09 / .10½
Zinc stearate	lb.	.20 / .25

Synthetic Rubber

DuPrene	lb.	1.00

Tackifier

B. R. H. No. 2	lb.	.015 / .017

Varnish

Shoe	gal.	

Vulcanizing Ingredients

Sulphur		
Chloride, drums	lb.	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 lbs.	
Rubber	100 lbs.	1.95 / 2.80
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

Waxes

Carnauba	lb.	.33½/ .35
Montan	lb.	.10½/ .11
Paraffine (128/130 refined)	lb.	.06½

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934		
Jan.	2,521,961	$239,054
Feb.	1,983,210	193,732
Mar.	2,539,425	257,545
Apr.	2,988,131	321,390
May	3,151,740	368,642

Data from United States Department of Commerce, Washington, D. C.

Tire Production Statistics

Pneumatic Casings—All Types

	In-ventory	Produc-tion	Total Shipments
1932	6,115,487	32,067,732	32,200,820
1933	7,110,456	36,243,384	35,274,970
1934			
Jan.	9,393,857	3,803,939	3,125,726
Feb.	10,403,282	4,205,039	3,186,363
Mar.	11,301,142	5,024,718	4,096,273
Apr.	11,621,310	4,626,881	4,305,227
May	10,792,770	4,322,536	5,171,748

Solid and Cushion Tires

1932	23,830	97,089	108,581
1933	.....	130,987	126,990
1934			
Jan.	29,971	13,792	13,946
Feb.	.....	12,440	12,797
Mar.	28,280	15,017	15,273
Apr.	.....	16,217	13,701
May	.....	18,639	17,551

Inner Tubes—All Types

1932	5,309,551	29,513,246	30,328,536
1933	6,251,941	34,044,689	33,112,472
1934			
Jan.	8,150,708	3,444,574	3,102,931
Feb.	8,892,154	3,956,082	3,223,591
Mar.	9,936,574	5,038,649	3,994,683
Apr.	10,267,331	4,593,370	4,212,020
May	9,741,304	4,228,239	4,754,683

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1932	128,981,222	416,577,533	15,703,800,000
1933	148,989,293	512,489,423	15,880,746,000
1934			
Jan.	16,437,210	59,957,163	1,239,798,000
Feb.	18,720,923	63,400,171	1,047,816,000
Mar.	20,927,389	75,636,859	1,298,472,000
Apr.	19,371,041	69,930,591	1,374,870,000
May	18,785,428	67,636,897	1,601,922,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 80% for previous years, with the exception of gasoline consumption.

COTTON AND FABRICS

THE lowest acreage planted to cotton since 1905 was reported in the July 1 bulletin of the Department of Agriculture, both as a result of efforts at restriction through the Bankhead Bill and because of the severe drought in Texas and Oklahoma. It was estimated that 28,024,000 acres were planted to cotton, which would produce about 10,189,272 bales. Since this figure was 1,000,000 bales less than traders had estimated, prices rose almost 1¢ a pound the week of the report.

For the first 3 weeks in July drought conditions in the Southwest were unrelieved, thus aggravating the poor crop results expected. Temperatures of over 100° were maintained day after day, following the slightest rainfall in 40 years for June. In the East, where too much rain has fallen, weevil infestation and grassy land have undermined the crop.

Weather reports, as a consequence, played an important part in Exchange transactions. Speculators in large numbers are in the market. It is not too late to save the crop if it rains and if the weather for the remainder of the season is ideal. At the slightest hint of moisture longs would unload their holdings, only to have them taken up by mills. Domestic spinners hesitated at first about buying cotton, but as the drought continues, they have been forced to protect themselves.

Prices of finished goods have also risen in the last month, although the June rate in the spinning industry was only 72.7% of capacity against 129.1% a year ago. July takings are expected to be 200,000 bales under those of a year ago, but if the rain holds off, the figures will probably be revised upward. It must be remembered that a year ago mills bought heavily under the threat of inflation; yet for the first 11 months domestic mills have taken only 200,000 bales less than in 1933.

Exports are 775,000 bales behind those of a year ago, with a further decline expected because of the curtailed operations by German mills. Germany is our second largest customer, and imports of cotton can only be made by exchanging German goods for the same value.

The crop has been hit hard and may be hit harder if the weather does not improve. Until the August 1 condition report is released, traders will probably watch their commitments closely.

Week ended June 30. Weather news continued as the chief influence on the cotton market, with only 2½ inches of rain reported in Texas for June and May, the lowest in 40 years. Many producers sold during the session, but buying sustained prices.

Gains for the week were from 20 to 28 points. July closed at 12.22¢, compared with 11.94¢ last week; October 12.42 against 12.22; December 12.57 against 12.33; January 12.62 against 12.38; March 12.73 against 12.49; and May 12.82 against 12.59.

Added to the drought in Texas is the report from Mississippi, where government agents found a 15% weevil infestation, the figures going as high as 57% in the southern part of the State and 1% in the northern section.

Forwardings to domestic mills last week were 64,000 bales, up 2,000 from the preceding week, but below the 1933 total of 179,000 bales. World takings of American cotton in May totaled 1,135,000 bales, against 1,136,000 in April and 1,340,000 in May, 1933, according to the New York Cotton Exchange.

George A. Sloan, president of the Cotton Textile Institute, Inc., in a review of the first year of operation under the NRA code, made the following points as to the advantages gained:

1. An increase of 40% in the number of persons employed, the figure now standing at approximately 460,000.
2. An increase in payrolls during the first 10 months under the code, as compared with the 10 months prior to the code, of $113,000,000, or 78%.
3. An increase of 67% in hourly wage rates.
4. A decrease of 26% in average working hours; the standard work week for mill operatives prior to the code averaging 54 hours as compared to 40 hours under the code.
5. Weekly income of cotton mill workers, adjusted to changes in the cost of living in 1934, average 25% above the previous year and 6% above 1929.

He also offered "a loyal word of caution as to the pitfalls that threaten our forward path toward sound recovery," in the following points:

1. Full responsibility should be placed on those code authorities that have demonstrated capacity for sound economic thinking and a proper regard for the public interest.
2. If code authorities are to be held responsible to the government for the conduct of their industries, the right to exercise administrative power must accompany such responsibility, always subject to governmental veto if this right is abused. If government is to assume the initiative for industry, industrial leadership will be destroyed and in its place will follow an inefficient and burdensome bureaucracy.
3. Removal of the fear that basic code provisions may be subjected to further experimentation before policies heretofore agreed on can be fairly tested by experience.
4. Rigid enforcement of code provisions and prompt effective action by the government in case of wage and hour violations.
5. Avoidance of any compromise of principle or unwillingness to deal with facts in the face of threatened force, either from employers or employes.
6. A never-relaxing recognition of the partnership relation between industry and government—thus increasing the willingness and desire of individual business men to cooperate whole-heartedly with their respective code authorities and with the government.

Week ended July 7. Scattered rains in Texas and Arkansas sent cotton prices down on 3 days of the last 5. The amount of moisture was small, but speculators sold their holdings until October was within 3 points of 12¢ a pound. The political unrest in Germany, weakness in stocks and grains, and the approaching government report, due Monday, further depressed prices.

At the close quotations were from 34 to 39 points down. July was 11.88¢ against 12.22¢; October 12.07 against 12.42; December 12.20 against 12.57; January 12.25 against 12.62; March 12.34 against 12.73; and May 12.45 against 12.82.

The Exchange predicts a crop of 29,180,000 acres, according to the average of its 56 members. Private estimates range from 27,000,000 to 35,000,000, with a Chicago house putting the condition at 66.9, against 71.9 last month, or an indicated yield of 9,843,000 bales.

The Secretary of Agriculture has indicated that the processing tax may have to be revised after public hearings. Farm products in June showed a gain of only 8% over last year; while those products other than farm gained 11%. In the meantime mills are trying to get a reduction in the tax, pointing out that consumers have paid an average of 10.81¢ for raw cotton, plus 4.2¢ processing tax, or better than 15¢ a pound, compared with the 7.37¢ average paid at the same time a year ago.

Forwardings last week were 45,000 bales, against 64,000 in the previous week and 149,000 a year ago. Domestic spinners in the last 2 months have taken only 550,000 bales, against 1,330,000 last year, and mills of the world reduced their takings in May and June by 1,100,000 bales. World consumption for the first 10 months is put at 11,621,000 bales by the Exchange Service. May figures were 200,000 bales behind last year; June's drop was a little greater, since last year world mills used the extremely large total of 1,375,000 bales, and 1,267,000 in July, 1933, 500,000 bales higher than the normal for the last 2 months of the season.

Week ended July 14. The smallest crop since 1905 was forecast in the government report on the July 1 condition of cotton. A prediction of 10,189,272 bales for the present crop was about 1,000,000 bales under the estimates of market observers. This, together with the severest drought in 40 years in Texas and Oklahoma, served to send prices to the highest levels since 1930. At the close of the week quotations were from 94 to 95 points above those prevailing Saturday a week ago.

July closed at 12.83¢, compared with 11.88¢; October 13.00 against 12.07; December 13.14 against 12.20; January 13.20 against 12.25; March 13.28 against 12.34; and May 13.36 against 12.45.

The Federal Crop Reporting Board put the acreage at 28,024,000, 31.4% less than that a year ago and 32.4% under the 5-year average for 1928-1932. In 1921 the crop was also under 30,000,000 bales, but was 1,700,000 higher than the present estimate. The yield per acre is put at 173.8 pounds, pointing to a crop of 10,189,272 bales.

Last year after the Agricultural Adjustment Administration paid a cash bonus for cotton plowed under, the crop was 40,852,000 acres, far above the 1934 estimate of 28,024,000 acres. Under this year's plan for a 40% cut from the 5-year average of 41,437,000 acres, the territory planted would have amounted to 24,863,000 acres, making the present crop 3,000,000 acres higher than the goal set. But the low yield per acre will produce less cotton than is permitted under the Bankhead Act to be free of the ginning tax.

With Texas and parts of Oklahoma on the emergency drought list, and with June precipitation only 0.82 inches, the crop there is stunted in growth, has small bolls, and is blooming and shedding. In the Mississippi Valley where rain is not needed further downpours were recorded.

With raw material prices rising almost $5 a bale in a week, mills are raising prices on their finished goods and making purchases in the market for protection. The June consumption figure for domestic mills was only 363,000 bales, or 334,000 less than that in June, 1933. Last year's takings, however, were abnormal since purchases were made to avoid the processing tax.

June exports were 459,000 bales, worth $28,487,000, compared with exports of 285,000 bales, worth $17,298,100, in May and with 615,000 bales, worth $28,999,000, in June, 1933.

For the first 11 months this year exports were 7,229,000 bales, value $401,563,000, against 7,727,000 bales, value $306,244,000, in the same 1933 period, a drop of 6.5% in volume, but an increase of 31% in value.

Week ended July 21. After a 10-day rise taking cotton prices well above 13.00¢ quotations broke in the middle of the week under profit taking, a weak stock market, and adverse news from Germany. But the continued drought in the Southwest and a new heat wave over most of the cotton belt lent firmness to prices at the week-end, with gains of 17 to 21 points on Saturday or net gains of from 1 to 6 points for the week.

July closed at 12.90¢, compared with 12.83¢ last week; October 13.04 against 13.00; December 13.17 against 13.14; January 13.21 against 13.20; March 13.31 against 13.28; and May 13.39 against 13.36.

From Germany came reports of mills on a 36-hour week. The ruling that American cotton could only be purchased by giving an equivalent amount of German goods in exchange has made it difficult to make importations. Traders consequently fear that takings of American cotton by Germany will fall far below those of previous years.

The Census Bureau reported spinners operated at 72.7% of capacity in June, compared with 98.2% in May, and 129.1 in June, 1933. July consumption by mills is expected to be 200,000 bales under that in July, 1933.

Forwardings last week were 184,000 bales, against 161,000 the previous week and 287,000 in the same 1933 week. Exports are now 780,000 bales less than those in the same period last year. The visible supply of American cotton is 5,458,000 bales, compared with 6,719,000 at the same time in 1933.

Private advices that rain had fallen in sections of Texas caused breaks of 28 to 30 points on July 23, but a rally in the afternoon lifted prices, which closed from 4 to 6 points under Saturday's close. The rally came after reports stated the rainfall was inadequate although cloudy conditions prevailed in the southern and western sections of Texas and in the Mississippi Delta.

On July 24 the market failed to reach the final levels of the 23rd. Cotton futures also declined and ended at the low of the day, when prices were barely steady. Spot middlings closed at 12.85¢, 25 points off Monday's close.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
June 30	12.40
July 7	12.19
July 14	12.87
July 21	13.22

New York Quotations

July 25, 1934

Drills		
38-inch 2.00-yard	yd.	$0.16
40-inch 3.47-yard		.09½
50-inch 1.52-yard		.21⅜
52-inch 1.85-yard		.17⅞
Ducks		
38-inch 2.00-yard D. F.	yd.	.16¼
40-inch 1.45-yard S. F.		.22
72-inch 1.05-yard D. F.		.31⅜
72-inch 17.21-ounce		.36
MECHANICALS		
Hose and belting	lb.	.35
TENNIS		
52-inch 1.35-yard	yd.	.24½
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.19½
40-inch No. 72		.21½
RED SEAL		
30-inch	yd.	.17
40-inch		.18½
50-inch		.24½
Osnaburgs		
40-inch 2.34-yard	yd.	.14
40-inch 3.00-yard		.10⅝
40-inch 10-ounce part waste		.16
37-inch 2.42-yard		.13
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.10¼
Plaids 60 x 48		.11
Surface prints 60 x 64		.12¾
Print cloth, 38½-inch, 60 x 64		.06⅞
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.11¼
64 x 68, 3.15-yard		.10¼
56 x 60, 3.60-yard		.09
44 x 48, 3.75-yard		.07⅛
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.06⅛
44 x 40, 6.15-yard		.05¼
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.43½
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.43½
9¾ ounce 60" 10/2 ply Karded peeler	lb.	.43½
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.43½
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.41½
23/5/3 Karded peeler, 1¼" cotton	lb.	.52½
23/5/3 Combed Egyptian	lb.	.59½
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.36½

*Prices for 1,200 yards of a width or over.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. Market conditions are tightening, owing to several conditions, including curtailed production; restricted cotton acreage; probable lowered production per acre as against last year because of severe and prolonged drought in Oklahoma and Texas cotton areas; also strikes of cotton mill operatives that in a number of instances shut off production completely. These adverse conditions point to possible scarcity, particularly in heavy fabrics supply. The situation is receiving the earnest attention of alert buyers, and provision is being made for freer shipments under outstanding fabric contracts. More lively interest also exists in placing additional orders for fabrics for early and future deliveries.

RAINCOAT FABRICS. In the raincoat fabrics trade appears very little activity, although fall business is starting. Raincoat manufacturers have all their lines complete, and the sales demand is reported satisfactory.

SHEETINGS. Since the government acreage report on July 9 raw cotton advanced about $5 a bale, and sheeting prices rose accordingly. Sales for recent weeks have more than equaled current production of the same period. Higher prices are expected in view of the strong raw cotton market.

TIRE FABRICS. The demand for tire fabrics is moderate and seasonal. Prices are nominal, steady, and unchanged.

University of Southern California, in its Chemical Engineering Department will give during the coming fall and spring terms, respectively, 2 courses on "Rubber Technology" and "Synthetic Resins." The courses will consist of 12 evening lectures and discussions, to be given by R. B. Stringfield, secretary-manager of the Dental Plastics Co., 1702 E. 61st St., Los Angeles, Calif. Mr. Stringfield was formerly chief chemist of the Goodyear Tire & Rubber Co. of California.

Goodyear Tire & Rubber Co. of California, 6701 Central Ave., Los Angeles, Calif., makes automobile and truck tires and tubes and solid and cushion truck tires and accessories. The company has several branches on the Pacific Coast. Company officers are: Paul W. Litchfield, president; H. J. Young and W. H. Fleming, vice presidents; J. L. Goddard, secretary; J. S. Willaman, treasurer; and R. J. Brady, purchasing agent.

RUBBER SCRAP

DURING July the demand for rubber scrap held up very well in volume. Export market conditions were equally satisfactory, the demand as usual being chiefly for inner tubes and solid tires.

BOOTS AND SHOES. Trade in footwear rubber scrap is dull. This grade is reclaimed largely for use in wire insulation and automobile topping, both of which are in reduced production.

INNER TUBES. A very good and steady demand prevails for inner tubes both for domestic consumption and export.

TIRES. The demand for tires is increasing in volume. The stocks available for collection are exceptionally large throughout the country. The prices of mixed auto tires dropped 50¢.

SOLID TIRES. The export demand for solids holds up to large proportions. The domestic demand is also very good.

MECHANICALS. All grades of mechanical goods scrap are rather quiet at quotations the same as last month.

CONSUMERS' BUYING PRICES
(Carload Lots Delivered Eastern Mills)
July 25, 1934

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01¾/$0.01⅞
Colored	lb.	.01⅛/ .01¼
Untrimmed arctics	lb.	.01⅛/ .01¼
Inner Tubes		
No. 1, floating	lb.	.06¾/ .07
No. 2, compound	lb.	.03¾/ .04
Red	lb.	.02¾/ .02⅞
Mixed tubes	lb.	.03¼/ .03⅜
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	9.75 /10.00
Beadless	ton	16.00 /16.50
Auto tire carcass	ton	11.00 /12.00
Black auto peelings	ton	20.50 /21.00
Solid		
Clean mixed truck	ton	40.00 /41.00
Light gravity	ton	40.00 /42.00
Mechanicals		
Mixed black scrap	lb.	.01 / .01⅛
Hose, air brake	ton	15.00 /16.00
Garden, rubber covered	ton	13.00 /13.50
Steam and water, soft	ton	13.00 /13.50
No. 1 red	lb.	.01⅞/ .02
No. 2 red	lb.	.01⅛/ .01¼
White druggists' sundries	lb.	.02 / .02⅛
Mechanical	lb.	.01¼/ .01½
Hard Rubber		
No. 1 hard rubber	lb.	.10¾/ .10⅞

Crude Rubber

(*Continued from page* 64)

long tons was taken by United States manufacturers in June, against 43,012 long tons for May and 50,743 in June, 1933, according to the Rubber Manufacturers Association. Imports were 49,683 long tons, or 3.6% higher than in May and 118.6% over June, 1933. Domestic stocks on June 30 were 358,149 long tons, against 351,329 on May 31, and were 6.5% over those of June 30, 1933. Crude rubber afloat for the United States was 46,698 long tons, against 57,921 the month before and 63,608 a year ago. The drop in shipments afloat is a good sign.

May figures for pneumatic casings showed shipments of 5,331,699 units, 20.1% over April and 2.9% over May, 1933. Production, at 4,456,223 casings, dropped 6.6% and 14.1% for the 2 periods, respectively. Stocks on hand were 11,126,567 units, 7.1% less than the prior month, but 64.6% higher than a year ago.

Production of automobiles turned sharply upward last week after the holiday. Dealers report that contrary to the usual seasonal trend, sales have been holding up well. June sales were 308,051 automobiles, against 331,652 in May and 249,727 in June, 1933. For the first 6 months sales were 1,714,325 units, against 990,114 in the same time last year.

The export trade in rubber goods also has held up well. The Department of Commerce reports that the value of June exports was $2,182,963, against $1,958,241 in May and $1,261,591 in June, 1933. For the first 6 months rubber goods to the value of $10,922,496 were exported, compared with a value of $7,203,905 in the same period a year ago.

Outside prices rose slightly under a fair amount of factory business. July was unchanged at 14⅝¢; August-September 14⅞ against 14¾; October-December 15⅛ against 15⅛; and January-March 15½ against 15⅛.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for June, 1934:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	June, 1934	
To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	8,468	415
United States	27,632	408
Continent of Europe	9,967	285
British possessions	1,730	13
Japan	3,597	6
Other countries	757	4
Totals	52,151	1,131

Rubber Imports: Actual, by Land and Sea

	June, 1934	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	1,649	7,961
Dutch Borneo	1,837	4,663
Java and other Dutch islands	634	23
Sarawak	1,870	16
British Borneo	422	52
Burma	169	14
Siam	844	653
French Indo-China	65	16
Other countries	83	10
Totals	7,573	13,408

On July 23 and 24 the market was featureless. On Tuesday closing prices on futures declined to as follows: August 14.60¢; September 14.72; October 14.85; and November 14.98.

In the Outside Market very little interest is shown by manufacturers because of seasonal dullness in most rubber goods. On July 24 spot ribbed smoked sheets declined to 14½¢.

New York Quotations

New York outside market rubber quotations in cents per pound

	July 25, 1933	June 25, 1934	July 25, 1934
Plantations			
Rubber latex, normal	gal. 72	60	60
Sheet			
Ribbed, smoked, spot	8¾/8⅝	13⅝	14⅛/14⅜
Aug.-Sept.	8½/8¾	13⅞	14¼
Oct.-Dec.	8¾/9	14¼	15
Jan.-Mar.	9	14⅜	15⅜
Crepe			
No. 1 thin latex, spot	9 /9⅜	15½/15⅝	16¼/16⅜
Aug.-Sept	9¼/9½	15⅜/15¾	16½
Oct.-Dec.	9½/9¾	16 /16⅛	16¾
Jan.-Mar.	9¾/10	16⅜/16½	17⅛
No. 3 Amber, spot	7 /7¼	11⅜	12 /12⅛
No. 1 Brown	7¼/7½	11½	12⅛/12¼
Brown, rolled	6¼/6½	9⅜/ 9½	9⅛/ 9¼
Paras			
Upriver fine	10¾	11¼	11
Upriver fine	*14¾	*13¼	*14½
Upriver coarse	..	7½	..
Upriver coarse	*10	*10¼	*12
Islands fine	9	10½	..
Islands fine	*14½	*13	..
Acre, Bolivian fine	11	11½	12
Acre, Bolivian fine	*15	*13½	*15
Beni, Bolivian	11¼	11¾	11¾
Madeira fine	11	11¼	..
Caucho			
Upper ball	..	7½	7½
Upper ball	*10	*10¼	*10¼
Lower ball	..	7	7
Pontianak			
Bandjermasin	9½/10	6	6
Pressed block	14 /14½	11¾	12
Sarawak	9½/10	6	6
Manicobas			
Manicoba, 30% guar.	†6	†6¾	†8
Mangabiera, thin sheet	..	..	..
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	11	10	10
Black Kassai	10½	9¾	9¾
Prime Niger flake	17½	16	16
Gutta Percha			
Gutta Siak	14 / 15	10	9½
Gutta Soh	16½/ 17	15	14½
Red Macassar	1.60 /1.75	1.50	1.50
Balata			
Block, Ciudad Bolivar	27 /29	50	52
Manaos block	27 /29	50	52
Surinam sheets	42 /44	47	47
Amber	45 /50	52	52

*Washed and dried crepe. Shipments from Brazil. †Nominal.

U. S. Crude and Waste Rubber Imports for 1934

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1934	Totals 1933	Balata	Miscellaneous	Waste
Jan. tons	44,988	973	182	61	..	..	..	46,204	31,110	73	693	32
Feb.	30,164	750	118	..	..	..	..	31,032	18,875	70	607	..
Mar.	43,204	901	450	..	..	50	..	44,605	27,879	169	415	157
Apr.	44,394	827	324	..	17	100	..	45,662	19,459	165	633	99
May	46,440	1,230	181	..	3	100	..	47,954	27,556	143	616	117
June	48,275	1,235	115	..	8	50	..	49,683	22,729	128	553	27
Total, 6 mos., 1934 tons	257,465	5,916	1,370	61	28	300	..	265,140	.....	748	3,517	432
Total, 6 mos., 1933 tons	142,896	3,188	1,491	33	..	...	..	.....	147,608	597	3,500	11

Compiled from the Rubber Manufacturers Association, Inc., statistics.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

CHEMIST, WITH YEARS OF EXPERIENCE IN TESTING AND developing rubber compounds, druggists' sundries, hard rubber, molded goods, dry heat, steam and acid cures. Address Box No. 393, care of INDIA RUBBER WORLD.

CHEMIST, B.SC., WITH FOURTEEN YEARS' EXPERIENCE. Accustomed to independent investigation. Thorough training in mill room work and process control. Competent analyst. Address Box No. 394, care of INDIA RUBBER WORLD.

MAN, WITH 20 YEARS' EXPERIENCE IN CALENDER AND MILL room, also compounding. Capable of taking charge of calender room and mills. Can give excellent reference. Address Box No. 395, care of INDIA RUBBER WORLD.

FACTORY MANAGER OR COMPLETE MANAGEMENT OF SMALL or medium-size mechanical rubber goods factory. Experienced in molded goods, hose, extruded, cut goods, and hard rubber. Qualified to handle any phase of the business. Have record as producer of profits. Will make moderate investment and work on profit-sharing basis. Must be real opportunity for earnings. Address Box No. 396, care of INDIA RUBBER WORLD.

EXECUTIVE POSITION BY SUPERINTENDENT 25 YEARS WITH single concern supervising rubberizing wide variety of fabrics, manufacture of sewed and cemented rubber clothing, and the development of new products. Successful in organizing and handling help and getting quality product. Justifiable personal reasons for changing position. Excellent references can be furnished. Address Box No. 397, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

MAN, WITH YEARS OF EXPERIENCE IN THE MANUFACTURE of rubber goods, would like employment where this experience could be used. Compounding, milling, calendering, and curing all grades of stock, mechanicals and specialties, pure gum, and sponge. Address Box No. 398, care of INDIA RUBBER WORLD.

SUPERINTENDENT, YEARS OF EXPERIENCE IN RUBBERIZING all kinds of fabric, both calendered and spread, for raincoat materials, hospital sheeting, and specialties of all kinds. Complete knowledge of compounds and development of plant operation. Address Box No. 401, care of INDIA RUBBER WORLD.

WANTED: POSITION AS FACTORY MANAGER OR SUPERINtendent in small mechanical rubber plant, with low overhead, by experienced man who can add additional business; Christian concern; New England preferred, having calender, tubing machine, and presses. Address Box No. 402, care of INDIA RUBBER WORLD.

EXPERIENCED SALES EXECUTIVE, WITH TECHNICAL TRAINing, seeks position with manufacturer of rubber compounding ingredients. Either whole or part time. Address Box No. 406, care of INDIA RUBBER WORLD.

ORIGINATOR OF NEW PRODUCTS, SALESMAN, SALES LETters, advertising copy, and displays. Rubber articles I have originated and marketed have kept present connection profitably busy. Desire to change. Address Box No. 407, care of INDIA RUBBER WORLD.

YOUNG MAN: GRADUATE WORK IN CHEMISTRY. ENGINEERing graduate with 2 years' experience in rubber clothing, artificial suede and buck, friction, adhesive tapes, and pyroxylin goods. Go anywhere and at once. Address Box No. 408, care of INDIA RUBBER WORLD.

FACTORY MANAGER, WITH 20 YEARS' EXPERIENCE IN FOOTwear and mechanical goods, desires executive position of responsibility. Capable of taking entire charge of factory. Graduate M.I.T. Broadest technical experience. Highest references. Address Box No. 409, care of INDIA RUBBER WORLD.

(Advertisements continued on page 77)

Rubber Goods Production Statistics

Tires and Tubes*		1934 April	1933 April
Pneumatic casings			
Production	thousands	4,627	2,499
Shipments, total	thousands	4,305	2,923
Domestic	thousands	4,212	2,874
Stocks, end of month	thousands	11,621	5,419
Solid and cushion tires			
Production	thousands	16	7
Shipments, total	thousands	14	8
Domestic	thousands	13	7
Stocks, end of month	thousands	30	20
Inner tubes			
Production	thousands	4,593	2,282
Shipments, total	thousands	4,212	2,441
Domestic	thousands	4,141	2,410
Stocks, end of month	thousands	10,267	4,951
Raw material consumed			
Fabrics	thous. of lbs.	19,371	10,460
Miscellaneous Products			
Rubber bands, shipments	thous. of lbs.	342	191
Rubber clothing, calendered			
Orders, net	no. of coats and sundries	15,615	8,037
Production	no. of coats and sundries	13,795	14,227
Rubber-proofed fabrics, production, total	thous. of yds.	....	2,988
Auto fabrics	thous. of yds.	....	241
Raincoat fabrics	thous. of yds.	1,670	1,275
Rubber flooring, shipments	thous. of sq. ft.	....	218
Rubber and canvas footwear			
Production, total	thous. of prs.	....	3,172
Tennis	thous. of prs.	....	2,636
Waterproof	thous. of prs.	....	536
Shipments, total	thous. of prs.	....	3,672
Tennis	thous. of prs.	....	3,230
Waterproof	thous. of prs.	....	442
Shipments, domestic, total	thous. of prs.	....	3,637
Tennis	thous. of prs.	....	3,202
Waterproof	thous. of prs.	....	435
Stocks, total, end of month	thous. of prs.	....	14,462
Tennis	thous. of prs.	....	6,135
Waterproof	thous. of prs.	....	8,326
Rubber heels			
Production	thous. of prs.	17,802	10,353
Shipments, total	thous. of prs.	16,991	12,383
Export	thous. of prs.	328	281
Repair trade	thous. of prs.	4,673	4,441
Shoe manufactures	thous. of prs.	11,991	7,661
Stocks, end of month	thous. of prs.	39,961	23,740
Rubber soles			
Production	thous. of prs.	5,018	3,108
Shipments, total	thous. of prs.	4,739	3,256
Export	thous. of prs.	5	1
Repair trade	thous. of prs.	275	266
Shoe manufactures	thous. of prs.	4,459	2,988
Stocks, end of month	thous. of prs.	4,989	3,215
Mechanical rubber goods, shipments			
Total	thous. of dollars	4,379	2,273
Belting	thous. of dollars	863	371
Hose	thous. of dollars	1,498	903
Other	thous. of dollars	2,018	999

*Data for 1934 are estimated to represent approximately 97% of the industry.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

London Stocks, May, 1934

London	Landed Tons	Delivered Tons	Stocks, May 31: 1934 Tons	1933 Tons	1932 Tons
Plantation	5,541	5,764	42,173	41,944	56,040
Other grades	....	....	17	54	49
Liverpool					
Plantation	*2,097	*1,785	*54,007	*56,540	*59,926
Total tons, London and Liverpool	7,638	7,549	96,197	98,538	116,015

*Official returns from the recognized public warehouses.

Imports by Customs Districts

	May, 1934 *Crude Rubber Pounds	May, 1934 *Crude Rubber Value	May, 1933 *Crude Rubber Pounds	May, 1933 *Crude Rubber Value
Massachusetts	8,840,282	$879,449	6,951,675	$211,548
New York	82,592,988	7,679,098	47,470,587	1,408,960
Philadelphia	3,662,255	309,697	1,030,127	28,650
Maryland	4,872,484	405,963	2,162,097	52,128
Virginia	112,000	13,046	.....	.....
New Orleans	1,462,925	138,074	.....	.....
Los Angeles	9,647,427	883,524	2,057,581	57,547
San Francisco	434,560	47,007	112,000	2,550
Oregon	11,200	981	.....	.....
Ohio	142,678	13,042	103,697	4,588
Totals	111,778,799	$10,369,881	59,887,764	$1,765,971

*Crude rubber including latex dry rubber content.

World Rubber Absorption—Net Imports

Consumption	Long Tons—1934 Feb.	Mar.	Apr.	May
United States	41,065	48,684	45,957	44,462
United Kingdom	8,586	12,191	8,202	9,706
Net Imports				
Australia	950	671	415	769
Austria	*300	*300	*300	*300
Belgium	1,538	965	504	214
Canada	1,854	3,411	2,419	2,218
Czechoslovakia	516	976	465	1,767
Denmark	108	112	117	180
Finland	24	92	227	90
France	7,373	7,871	8,192	8,556
Germany	5,490	6,453	6,701	6,499
Italy	2,388	1,394	1,966	....
Japan	4,570	5,655	5,679	....
Netherlands	287	284	262	322
Norway	75	106	83	65
Russia	3,399	4,018	1,326	....
Spain	656	394	752	....
Sweden	257	526	790	605
Switzerland	59	156	142	194
Others	*2,250	*2,250	*2,250	*2,250
Totals	81,745	96,509	86,749	....
Minus United States (Cons.)	41,065	48,684	45,957	44,462
Total foreign	40,680	47,825	40,792	....

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

World Rubber Shipments—Net Exports

British Malaya	Long Tons—1934 Feb.	Mar.	Apr.	May
Gross exports	57,867	58,515	56,748	69,403
Imports	19,688	26,470	27,963	34,093
Net	38,179	32,045	28,785	35,310
Ceylon	8,620	6,750	5,157	8,870
India and Burma	775	1,412	762	....
Sarawak	1,005	1,360	1,447	1,892
British N. Borneo	*750	*750	*750	*750
Siam	1,264	1,363	1,311	997
Java and Madura	6,706	8,655	7,282	12,104
Sumatra E. Coast	10,277	12,043	11,324	16,720
Other N. E. Indies	17,466	25,064	24,054	34,710
French Indo-China	1,100	1,316	1,519	1,408
Amazon Valley	831	846	440	726
Africa	*200	*200	*200	*200
Guayule	....	50	100	100
Totals	87,173	91,854	83,131	113,787

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

Plantation Rubber Crop Returns by Months

1934	Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies—Java (60 Companies) Long Tons	Index	Netherlands East Indies—Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	368	75.2	1,402	68.7	403	71.7	12,981	104.4	2,821	107.4	4,411	109.4	130	71.8	22,516	100.7
February	355	72.6	1,111	54.4	127	22.6	12,108	97.4	3,041	115.8	4,747	117.7	70	38.7	21,559	96.4
March	389	79.6	1,201	58.8	382	68.0	11,813	95.0	3,424	130.4	4,784	118.7	108	59.7	22,101	98.8
April	378	77.3	1,412	69.2	490	87.2	11,286	90.8	3,328	126.7	4,575	113.5	142	78.5	21,611	96.6
May	389	79.6	1,496	73.3	495	88.1	12,386	99.6	3,458	131.7	4,722	117.1	154	85.1	23,100	103.3
5 months ending May,																
1934	1,879	...	6,622	...	1,897	...	60,574	...	16,072	...	23,239	...	604	...	110,887	...
1933	1,639	...	5,152	...	548	...	57,018	...	13,860	...	20,260	...	526	...	99,003	...

Note: Index figures throughout are based on the monthly average for 1929=100. Issued June 27, 1934, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Classified Advertisements

Continued

SITUATION OPEN

FOREMAN AND SUPERVISOR IN MAKEUP ROOM FOR RUBBER aprons and other pure gum specialties. Write full particulars. Address Box No. 405, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

EXPERIENCED RUBBER SALESMAN WISHES EXCLUSIVE representation in Greater New York territory for factories manufacturing corrugated rubber matting, perforated mats, sheet rubber tiling. Maintains own office and will work on straight commission arrangement. Address Box No. 400, care of INDIA RUBBER WORLD.

WANTED: MANUFACTURER EQUIPPED TO MAKE RUBBER mats such as used to cover auto running-boards. Can place substantial orders for same. Address Box No. 403, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED: EXPERIMENTAL MILL IN GOOD WORKING CONDITION. Address Box No. 399, care of INDIA RUBBER WORLD.

(*Advertisements continued on page 79*)

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	April, 1934		Four Months Ended April, 1934	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	98,204,710	$8,232,746	374,657,166	$27,663,753
Liquid latex	2,988,131	321,390	10,032,727	1,011,721
Jelutong or pontianak	1,194,421	98,658	4,486,207	414,627
Balata	286,894	50,965	984,671	182,323
Gutta percha	230,325	22,436	953,520	95,236
Guayule	224,000	18,928	336,000	28,392
Scrap and reclaimed, etc.	954,694	7,998	3,084,087	25,391
Totals	104,083,175	$8,753,121	394,534,378	$29,421,443
Chicle, crude ...*Free*	278,289	$74,701	2,537,474	$594,010
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers ...*pairs*	116,647	$36,123	573,571	$176,245
Rubber toys	.....	28,862	.....	97,120
Druggists' sundries, n. e. s.	.....	10,429	.....	27,782
Combs, hard rubber...*number*	69,534	3,587	574,398	25,749
Golf balls ...*number*	74,500	19,291	160,144	38,993
Tennis and other rubber balls ...*number*	403,573	27,556	872,203	59,745
Tires ...*number*	97	1,004	2,241	8,874
Other rubber manufactures	.....	44,952	.....	152,734
Totals	.....	$171,804	.....	$587,242

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	6,302,687	$588,453	22,105,271	$2,000,114
Balata	5,379	1,147	39,592	12,027
Guayule	11,200	946	16,800	1,419
Rubber manufactures	.....	1,108	.....	3,498
Totals	.....	$591,654	.....	$2,017,058

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	883,472	$38,707	3,051,815	$138,205
Scrap	3,390,973	60,385	14,932,843	282,625
Rubberized automobile cloth, *sq. yd.*	59,808	31,393	234,024	120,755
Other rubberized piece goods and hospital sheeting.*sq. yd.*	57,978	23,811	229,132	99,694
Footwear				
Boots ...*pairs*	3,048	7,747	20,476	51,816
Shoes ...*pairs*	21,530	8,892	70,307	36,295
Canvas shoes with rubber soles ...*pairs*	11,293	6,941	49,650	33,030
Soles ...*doz. pairs*	4,382	6,526	16,792	23,735
Heels ...*doz. pairs*	29,315	16,015	116,823	62,006
Water bottles and fountain syringes ...*number*	23,250	7,044	69,286	23,824
Gloves ...*doz. pairs*	5,881	12,347	17,491	35,283
Other druggists' sundries	.....	26,756	.....	111,256
Balloons ...*gross*	14,822	11,253	81,570	72,494
Toys and balls	.....	1,897	.....	11,775
Bathing caps...*doz.*	9,725	19,158	49,494	86,407
Bands	23,185	8,021	87,198	27,709
Erasers	26,881	15,596	99,190	52,784
Hard rubber goods				
Electrical goods	100,533	10,062	385,214	41,578
Other goods	.....	12,489	.....	52,780
Tires				
Truck and bus casings, *number*	34,341	501,977	93,550	1,420,672
Other automobile casings, *number*	75,378	483,845	288,666	1,943,010
Tubes, auto ...*number*	70,837	77,000	252,690	273,478
Other casings and tubes, *number*	6,554	18,568	14,200	39,007
Solid tires for automobiles and motor trucks.*number*	525	13,403	2,450	68,465
Other solid tires	125,851	14,434	518,114	66,468
Tire sundries and repair materials	.....	30,682	.....	120,789
Rubber and friction tape	57,988	14,953	198,903	51,129
Belting	227,088	90,276	799,719	341,405
Hose	316,874	87,751	1,358,675	387,113
Packing	81,350	35,499	356,530	151,416
Thread	111,256	63,381	414,321	249,417
Other rubber manufactures	.....	129,721	.....	404,872
Totals	.....	$1,886,530	.....	$6,881,292

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	March, 1934		Twelve Months Ended March, 1934	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude rubber, etc.	7,640,172	$754,788	51,139,855	$3,913,795
Gutta percha	1,020	872	8,692	7,403
Rubber, recovered	581,300	24,022	5,668,600	223,321
Rubber, powdered, and gutta percha scrap	276,400	4,797	2,618,800	42,692
Balata	4,832	1,931	19,555	8,641
Rubber substitute	41,600	11,129	253,200	56,317
Totals	8,545,324	$797,539	59,708,702	$4,252,169
PARTLY MANUFACTURED				
Hard rubber sheets and rods	1,085	$614	63,709	$14,688
Hard rubber tubes	.....	566	.....	7,664
Rubber thread not covered	6,790	4,704	115,222	95,199
Totals	7,875	$5,884	178,931	$117,551
MANUFACTURED				
Belting	.....	$7,638	.....	$51,342
Hose	.....	12,792	.....	58,155
Packing	.....	6,145	.....	47,185
Boots and shoes.....*pairs*	16,446	6,019	869,433	281,365
Clothing, including waterproofed	.....	2,170	.....	11,101
Raincoats ...*number*	3,399	8,421	13,329	41,519
Gloves ...*dozen pairs*	393	824	3,417	7,871
Hot water bottles	.....	55	.....	16,753
Tires, bicycle.....*number*	3,283	1,672	24,931	13,758
Pneumatic .....*number*	1,286	14,932	13,028	127,797
Inner tubes.....*number*	336	926	2,529	6,240
Solid for automobiles and motor trucks....*number*	33	888	279	8,337
Other solid tires	.....	430	.....	7,600
Mats and matting	.....	9,443	.....	47,886
Cement	.....	6,735	.....	65,522
Golf balls ...*dozen*	2,888	7,527	31,930	91,388
Heels ...*pairs*	8,773	595	96,774	5,385
Other rubber manufactures	.....	65,154	.....	636,110
Totals	.....	$152,366	.....	$1,525,314
Totals, rubber imports	.....	$955,789	.....	$5,895,034

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexport of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$6,924	.....	$48,846	.....
MANUFACTURED				
Belting	$34,386	.....	$286,412	.....
Canvas shoes with rubber soles	286,918	.....	1,029,381	.....
Boots and shoes	151,592	.....	2,173,548	.....
Clothing, including waterproofed	22,109	.....	103,566	.....
Heels	11,127	.....	161,794	.....
Hose	24,913	.....	97,371	.....
Soles	26,596	.....	208,766	.....
Tires, bicycle	.....	.....	89	.....
Pneumatic	599,472	.....	4,002,561	.....
Inner tubes	43,562	.....	304,724	.....
Solid	.....	.....	.....	.....
Other rubber manufactures	86,660	$4,250	551,664	$14,691
Totals	$1,287,335	$4,250	$8,919,876	$14,691
Totals, rubber exports	$1,294,259	$4,250	$8,968,722	$14,691

Low and High New York Spot Prices

		July	
PLANTATIONS	1934*	1933	1932
Thin latex crepe	15⅞/16⅝	7⅜/10½	3 7/16/4
Smoked sheet, No. 1 ribbed	13 13/16/14⅞	6½/9¾	2 5/16/3 3/16
PARAS			
Upriver fine	11¼/12	8¼/11	5½/5¾

*Figured to July 25, 1934. All prices in cents per pound.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
1668	Seller of balata resin, that is, the fraction soluble in hydrocarbons.
1669	Manufacturer of knives for slitting and skiving sponge rubber.
1670	Manufacturer of Pyroflex, a tank covering material.
1671	Manufacturer of a rubber door knob cover.
1672	Manufacturer of a rubber traveling bath tub.
1673	Manufacturer of taping machines.
1674	Manufacturer of reclaimed rubber.
1675	Manufacturer of airplane cloth.
1676	Manufacturer of Blancol.
1677	Source of supply of caoutchouc oil or Caoutchoucine.
1678	Source of supply of a vegetable coloring matter for use in rubber goods.
1679	Manufacturer of gasoline-proof rubber gaskets.
1680	Manufacturer of Gossamer raincoat cloth.
1681	Rubber scrap dealers interested in buying second-hand tires.
1682	Manufacturer of graphite powder 300 mesh.
1683	Manufacturer of Velvetex black filler.
1684	Manufacturer of Century and Disperso blacks.
1685	Manufacturer of Cumar E X.
1686	Manufacturer of linseed putty.
1687	Manufacturer of glycerine.

CREAMED LATEX *from Certified Trees*

Write "Lotol" into your specifications and you are writing a specification within a specification.

For the production of "Lotol" is governed by the most exacting sort of specification under expert supervision such as only this, the world's largest producer of Latex, can provide.

The very preparation of the soil preceding the planting of the carefully selected rubber trees and each step that follows . . . bud-grafting, fertilizing, tapping, etc., are under the expert supervision of specially trained agriculturists.

Then comes the blending of the Latex gathered from these selected and certified trees . . . and to minimize variations in properties, this Latex is shipped in bulk.

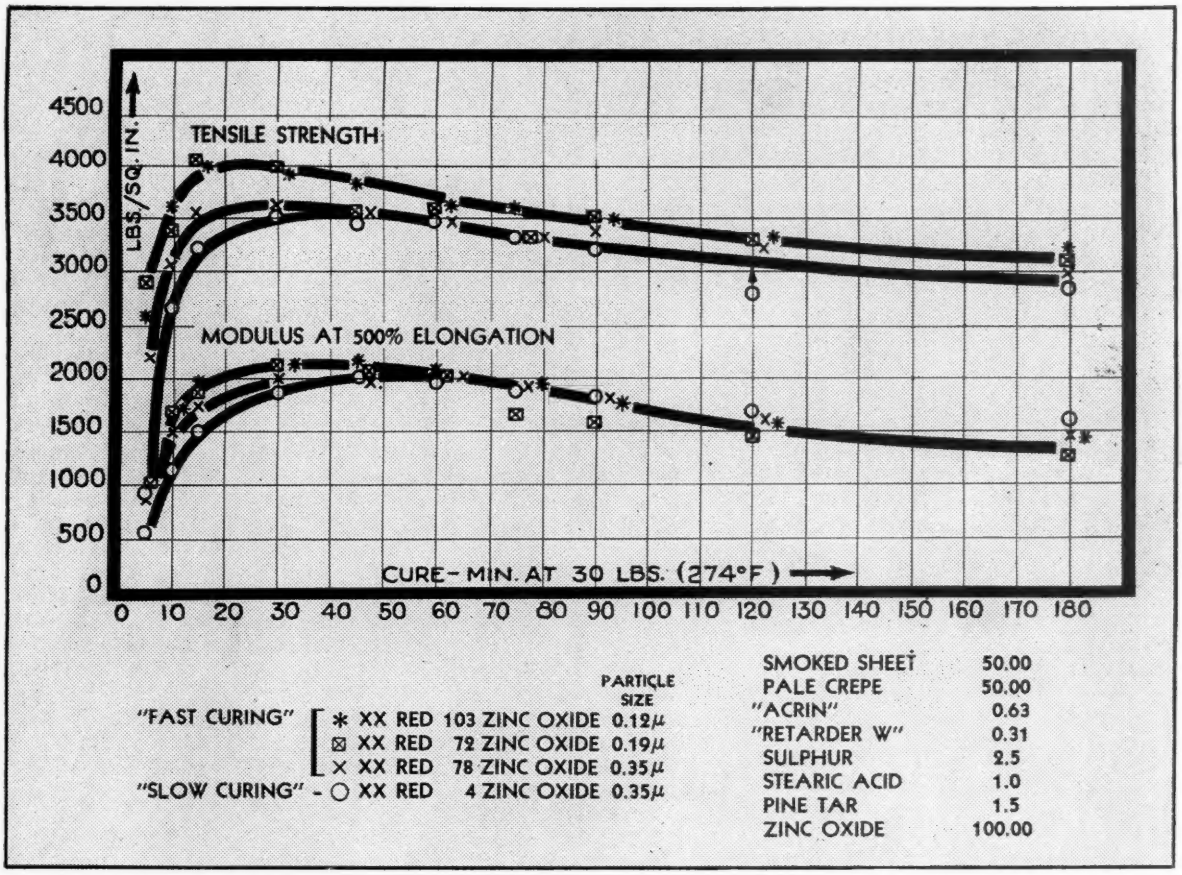
Much of this Latex is further purified by our exclusive creaming processes which not only concentrate the Latex but eliminate much of the non-rubber constituents, thereby producing a Latex unsurpassed for uniformity and dependability . . . Lotol.

This "Lotol" brings the cooperation of an expert technical staff in the use of Latex products in impregnating, sizing, coating, cementing, combining and fixing operations.

A phone call or letter will bring detailed information.

The Naugatuck Chemical Company

1790 BROADWAY, NEW YORK, N. Y.



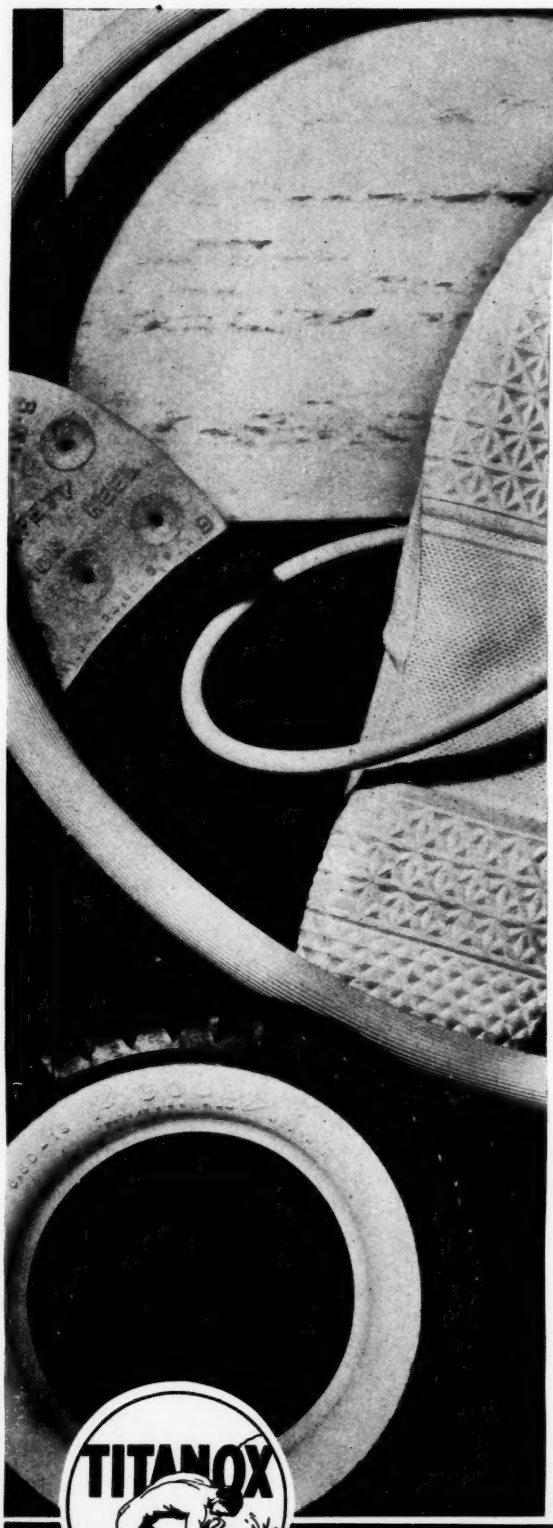
"FAST" and "SLOW" CURING ZINC OXIDES with "ACRIN"

The "fast" curing zinc oxides (XX Red 103, XX Red 72, XX Red 78) cure at a rate corresponding to the particle size. XX Red 4—"slow" curing zinc oxide —gives the characteristic retardation in the early cures and shows less deterioration in modulus in the extreme over-cures.

New Jersey Zinc

No. 30 of a series of charts showing a comparison of "FAST" and "SLOW" curing zinc oxides with typical accelerators.

The New Jersey Zinc Company 160 Front St. New York



WHITENESS AND BRIGHTNESS

improved...with this modern opaque pigment

WHEN rubber stocks must be produced in bright whites or clear, light colored tones of permanent brilliance, the best modern practice is to use Titanox-C (Titanium Calcium Pigment).

This opaque white pigment is especially high in coloring and tinting power. It produces bright whites and light tints of unusual clarity with very low pigment volume concentration.

This high tinting strength, combined with its low specific gravity, make it particularly desirable for coloring raincoats, footwear and other products where weight must be carefully considered.

Other advantages are fine particle size, ready dispersability and chemical stability. Titanox-C does not react with sulphur, sulphur compounds and the many accelerators used in rubber compounding.

Our technical staff is always ready to assist you. Just write our nearest office.

TITANIUM PIGMENT CO., INC.

Manufacturers of

TITANOX-B (Titanium Barium Pigment)
TITANOX-C (Titanium Calcium Pigment)
TITANOX-A (Titanium Dioxide)

111 Broadway, New York, N. Y.; Carondelet Station, St. Louis, Mo.; National Lead Co. (Pacific Coast Branch), 2240 24th St., San Francisco, Calif.; Canadian Distributor: **Wilson, Paterson, Gifford, Ltd.,** 3552 St. Patrick Street, Montreal—132 St. Helen's Avenue, Toronto.

TITANOX

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TITANOX

RECLAIMED RUBBER

The prestige that has grown up around PEQUANOC STANDARD RECLAIMS is based on constant vigilance, careful laboratory control, precise methods of processing and extra care in refining as a factor of safety.

A strong organization with old-fashioned ideas of honesty and courtesy is back of the QUALITY we sell and the SERVICE YOU RECEIVE.

PEQUANOC RECLAIMS are economical in the fabrication of nearly all rubber articles, with a tremendous advantage over crude in processing; supplying the full rubber content with one-half the mixing and power cost.

Thirty years of service to the trade.

PEQUANOC RUBBER CO.

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MODERN RUBBER MILL MACHINERY

BACKED BY 46 YEARS EXPERIENCE

OUR MODERN ROLLS are specially designed with light shell, made of high tensile strength material with improved internal pipes and stuffing boxes.

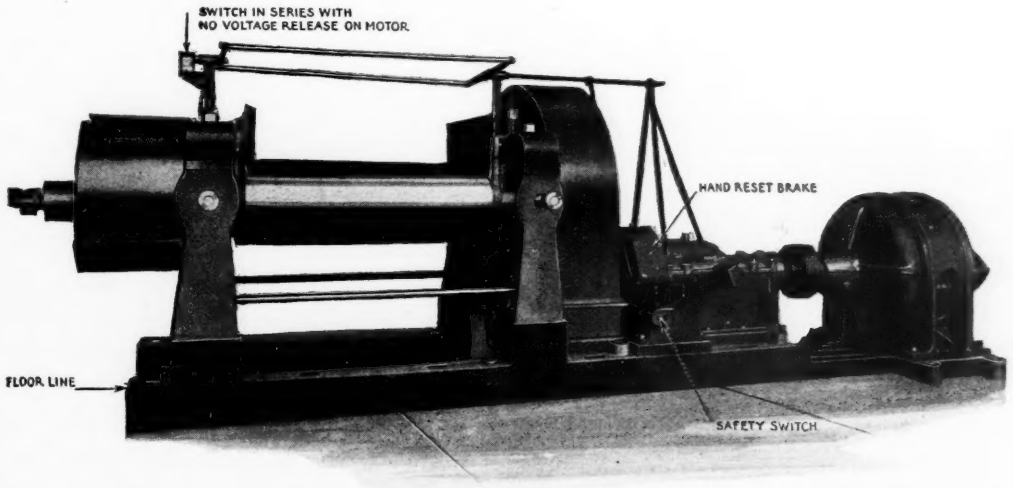
All these features are very important for quick heating and cooling today owing to the use of different compounds for quick cures, as these stocks will burn very quickly unless the rolls have such features.

OUR MODERN GUIDES have a number of improvements.

OUR MODERN ROLL BOXES have a method for keeping the oil from running from the roll necks into the stock.

OUR MODERN GEARING with light pitch, wide face, low ratio and high tensile strength material reduces vibration and increases efficiency.

OUR MODERN SAFETY EQUIPMENT—Our machines are fully equipped with safety stopping devices which stop the rolls in considerably less distance than required by the National, Labor Departments, and Insurance Companies codes—reducing liability insurance and increasing the efficiency of the operator.



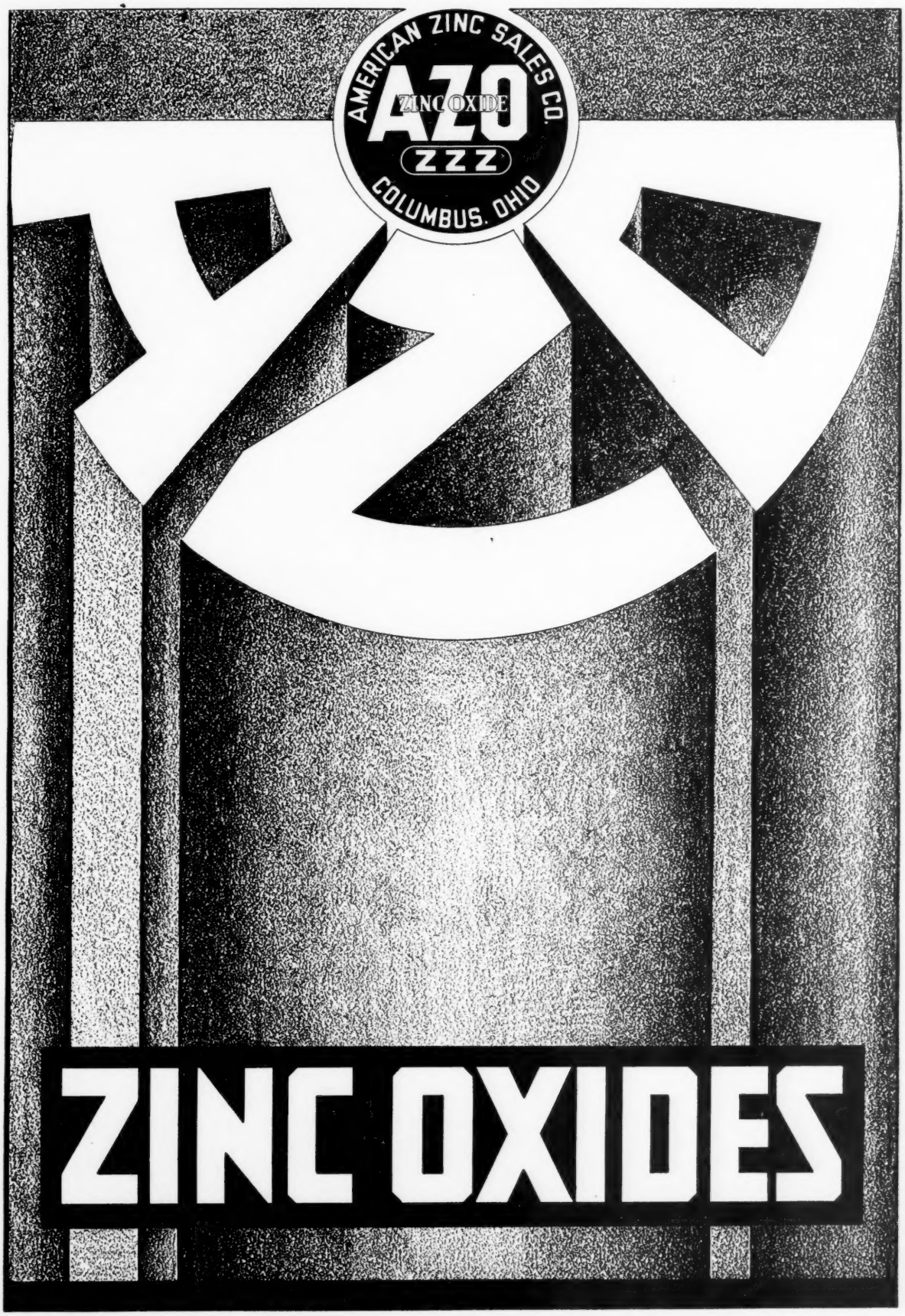
20″ and 22″ x 60″ Individual Motor-Driven Grinder or Mixer with Type R.N. Herringbone Gear Drive.

We do not use a separate herringbone gear drive, as the gear drive is built in the machine. The low speed Jack Shaft with high torque is at the lowest point in the bedplate, which overcomes vibration and increases efficiency. This shaft has (3) ring oiling bearings, babbitted and of the Removable Sleeve Type. The Herringbone Gears are enclosed in a cast iron oil-tight case. At the end of the pinion shaft is one of our Hand Reset Brakes for safety. Safety gear guards for stuffing boxes, connecting gears, and master gear and pinion, are made of solid metal.

Stopping Mechanism:—Stopping Mill in 10″ Roll Travel

TRENTON ESTABLISHED 1888 NEW JERSEY

WILLIAM R. THROPP & SONS CO.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